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TEXTILE WORLD.

With which is Incorporated the

INDUSTRIAL RECORD

The Textile World's Complete Directory of the Mill Trade and of Large Buyers of Textile Fabrics, for 1898, is now ready for delivery. It contains 400 pages, and 19 textile maps; several valuable new features have been added.

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With Patent Self-Feeding Clips.

Patent Combination Rolls

—OF—

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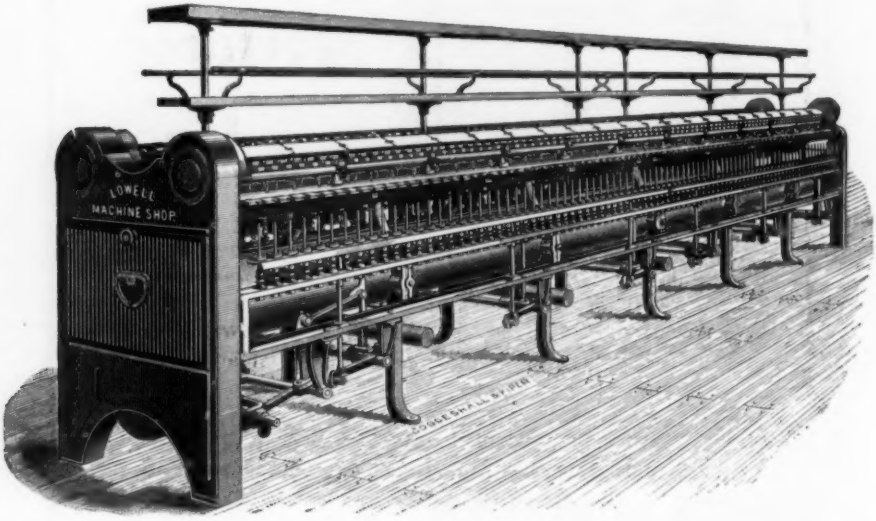

All parts are made on special tools to standard sizes and are interchangeable.

The greatest care is taken to have the frames constructed so as to obtain the greatest production with the highest speed.

All spindles are run in their bearings before being sent out.

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OF THE

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involves comparison with former similar innovations.

It is more expensive — yes, and so is the plain power loom more costly than the hand loom which it displaced.

Why not return to hand looms and get a cheap equipment also giving more laborers employment? The conservative should be more consistent.

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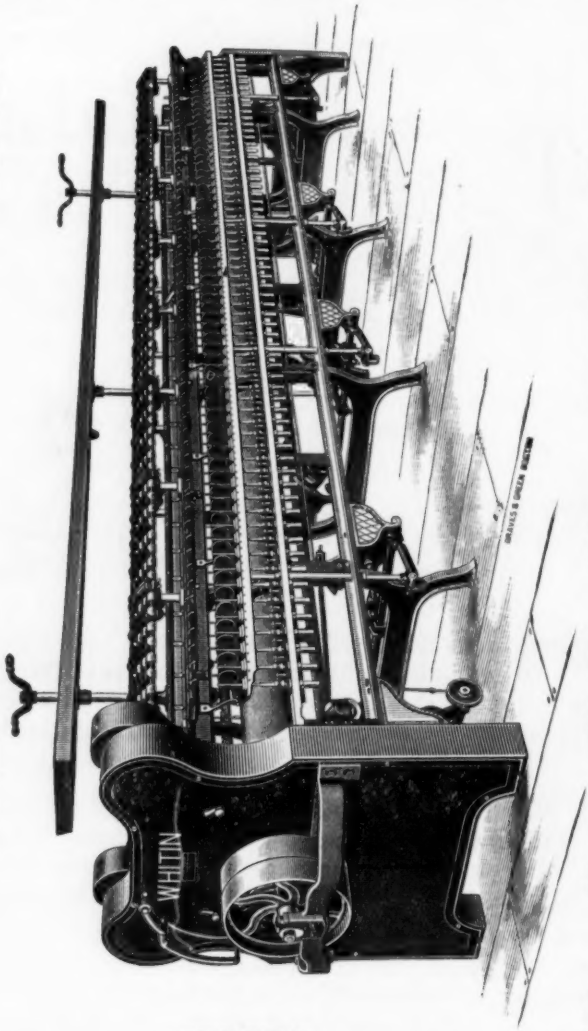

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Looms,

The New Whitin Ring Spinning Frame.

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MASON MACHINE WORKS,

TAUNTON, MASS.

COTTON MACHINERY

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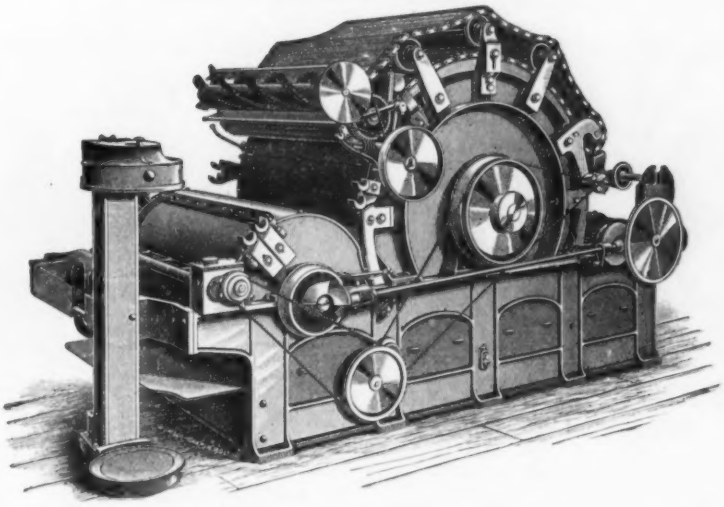

Cards, Combers, Railway Heads, Drawing Frames, Spinning Frames, Mules and Looms,

INCLUDING THE

Mason-Northrop Loom.

SOUTHERN AGENCY:

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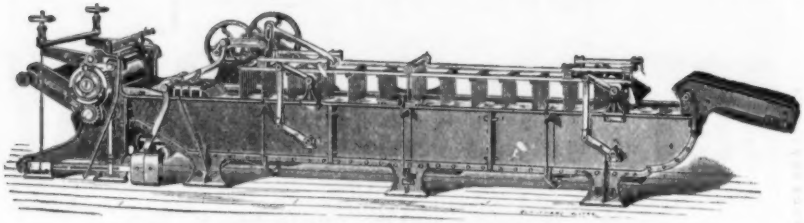

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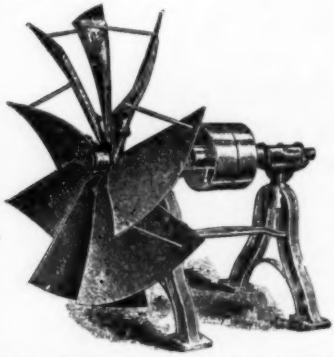

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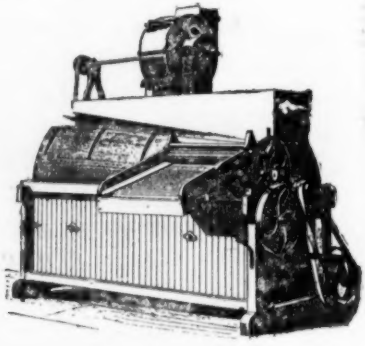
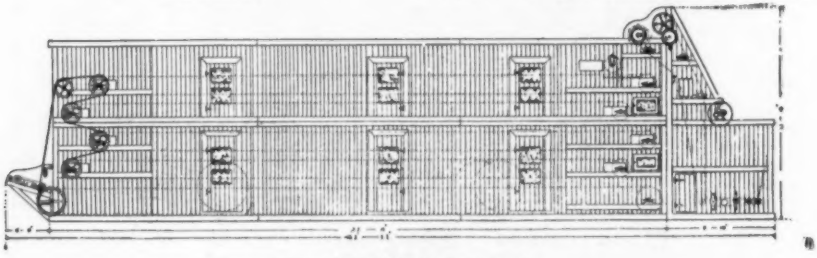


IMPROVED CONE DUSTER.
Exterior View Right-Hand Machine with Fan.



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We also Manufacture Multiple and Single Apron Dryers, Burr Pickers, Mixing Pickers, Crabbers, Self-feeders for Cotton and Wool; Breasts and Burr Machines for Cards. Wire Cylinders of all kinds repaired and Lickers-in for Cotton Cards a specialty.

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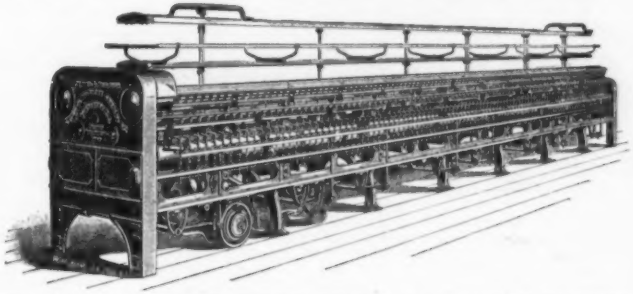

☞ This New Pattern Spinning Frame contains many valuable improvements which will certainly interest you and pay you to investigate. All parts are specially designed and so constructed as to obtain the highest speed and greatest production.

We Invite Investigation and Comparison.

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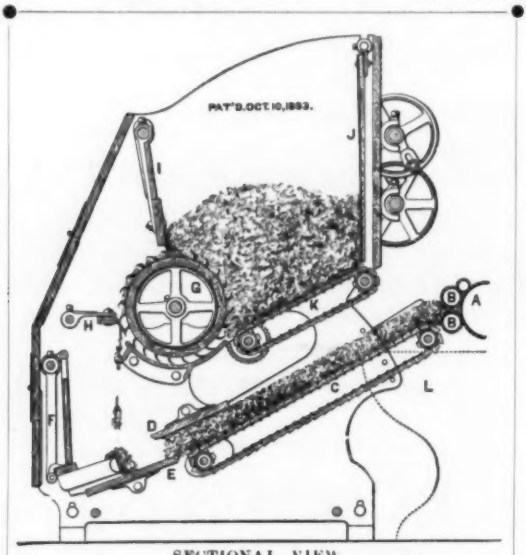

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THE FISHER CARD FEED is simple in construction, is strongly built, turns out even work, requires little changing, and feeds the same whether full or nearly empty.

It is built in all sizes and guaranteed as represented.

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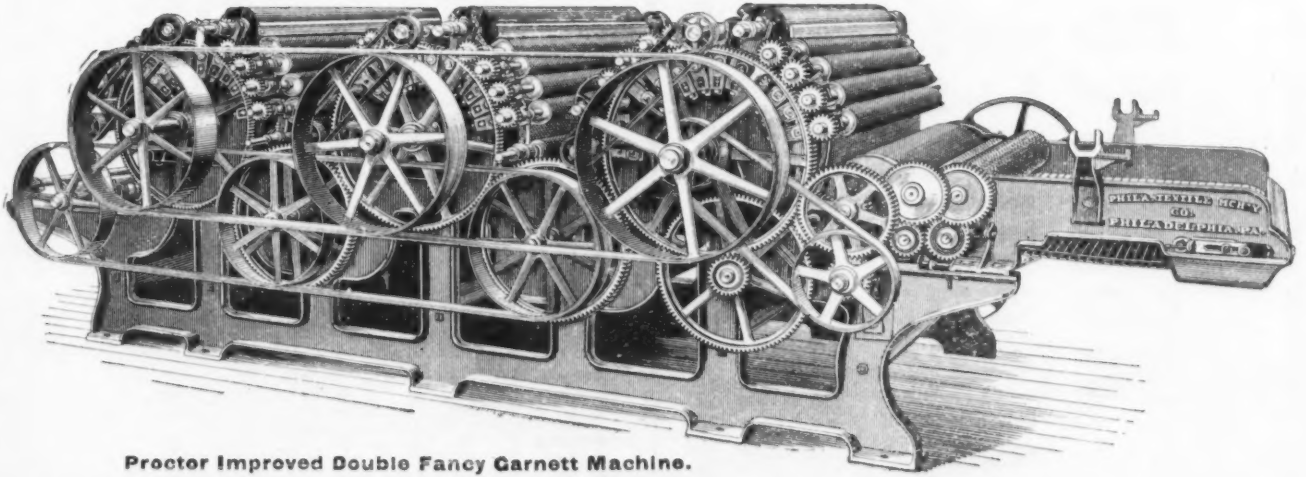

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We can furnish more than 100 different patterns of the common tail or stick picker used on cotton looms, at prices varying from 18 to 90 cents per pound, according to quality. We also make Loop Pickers for Northrop looms to fit any stick, and furnish these also in different grades at different prices. We offer the benefit of more than 30 years experience in the manufacture of loom pickers and confidently believe that our work is as good and our prices as low as it is possible to make them.

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"1894" pattern with Patent Flexible Bend with slots for direct setting of the flats to the cylinder by the gauge, and McConnell & Higginson's Patent Grinding Apparatus for grinding the flats from their working surfaces.

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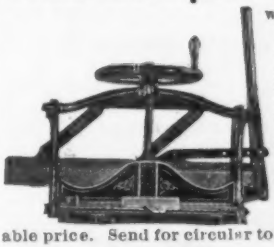

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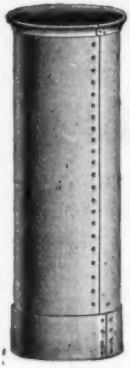

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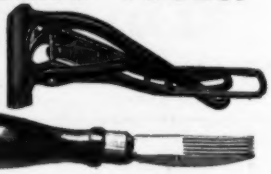

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For Setting Up Bent Teeth of Card Clothing, with a variety of other tools used by Carders and Manufacturers. Send for circular.

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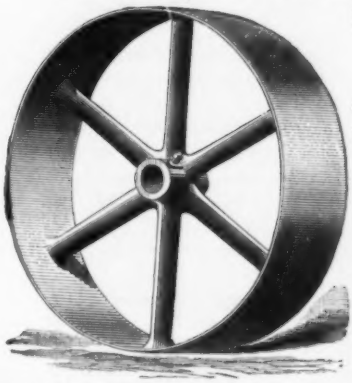

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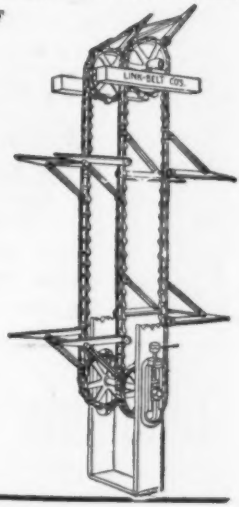

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For handling Cotton Rolls, Bundles, Packages, Coal, Ashes, etc. Catalogue upon application.

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AJAX drives the new mammoth grain elevator, in Manchester, England.

AJAX drives the great machinery of the Illinois Steel Company.

Use Ajax and Run No Risk of Accident.

H. CHANNON COMPANY

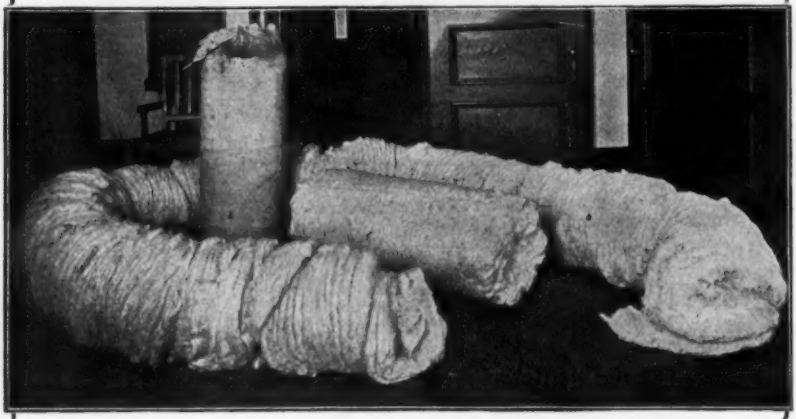
24 & 26 Market St., CHICAGO.

Reform should begin with..... the Bale.

Every cotton manufacturer recognizes the very great importance of an improved system of baling, but he may fail to appreciate how he can help the reform movement. He thinks he must take his cotton in any shape it comes to him. This may be true for a time, until the planter is brought to see that the manufacturer's interests are identical with his. Let every manufacturer, when buying, emphatically state his preference for such a bale as the Lowry press makes, and a tremendously powerful influence is created which cannot fail to expedite the desired end.

Other efforts along this line, in the way of a round bale, have met with only meager success because the presses were complicated and expensive and the plans adopted savored too much of monopoly.

The Lowry press is so simple and comparatively inexpensive that every gin in the South can have one. It is not to be controlled by a syndicate, but every planter may buy it. There need be no revolution in the methods of the cotton trade to introduce the Lowry bale, which possesses such manifest advantages that every one who saw it at the spring meeting of the New England Cotton Manufacturers most heartily approved of it.



THE LOWRY COTTON BALE.

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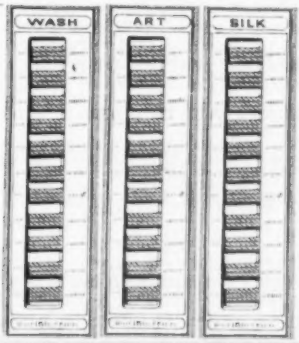

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Mr. Van Everen, of our office, was for a number of years an Examiner in the U. S. Patent Office, in the Division of Textiles.

List of Textile Patents.

Issued May 24 and 31, and June 7, 14 and 21, 1898.

Specifications and drawings furnished for ten cents each Address W. S. Gavey, P. O. Box 222, Brooklyn, N. Y.

Brushing or Combing Machine. 604,725. E. Cassanova, New Orleans, La.

Buckle. 604,812. G. N. Clark, Dry Ridge, Ky.

Carding Engine Doffer Driving Mechanism. 605,057. W. Hopkinson and R. Tyack, Accrington, England, assignors to Howard & Bullough Machine Co., Ltd., England.

Chenille Cutting Machine. 605,118. W. McCleary, Amsterdam, N. Y., assignor to McCleary, Wallin & Crouse, same place.

Cloth Folding Machine. 604,749. E. Hall, Worcester, Mass.

Combing Machine Stop Mechanism. 604,856. J. Denby, Bingley, England.

Cotton Elevator, Cleaner and Feeder. 604,426. J. W. Seifert, Dallas, Tex.

Cotton Fabrics, Apparatus for Applying finishing substances to. 605,434. C. H. Jacobs, Lyons, France.

Drying Frame for Woolen Garments. Folding. 605,383. H. Bristol, New Haven, Conn.

Dye and Making Same, Black Disazo. 605,103. M. Kahn and K. Heidenreich, Elberfeld, Germany, assignors to Farbenfabriken of Elberfeld Co., New York.

Dye, Anthraquinone. 605,568. R. E. Schmidt, Elberfield, Germany, assignor to Farbenfabriken of Elberfeld Co., New York.

Dye, Diphenylnaphthylmethane. 605,119. O. Nastvogel, Elberfeld, Germany, assignor to Farbenfabriken of Elberfeld Co., New York.

Embroidery Frame. 604,742. T. D. Elsner, West New York, N. J., assignor, by mesne assignments, to F. Brown, New York.

Embroidering Machine Jacquard mechanism. 604,755. H. Hill, Nottingham, England.

Embroidering Machines, Fabric holding device for. 604,741. T. D. Elsner, West New York, N. J., assignor, by mesne assignments, to F. Brown, New York.

Fabric. 605,567. O. A. Moses, New York, N. Y.

Fabric Turning Machine, Tubular. 604,512. R. Barrie, Philadelphia, Pa.

Fibrous Material. 606,067. J. A. Maquaire, Paris, France.

Knitting Machine. 604,738. J. H. Rice, assignor to Leighton Machine Co., Manchester, N. H.

Knitting Machine. 604,420. J. E. Rowe, assignor to E. Jenckes Manufacturing Co., Pawtucket, R. I.

(Continued on next page.)

Holland and Colonies.

Patents. Trade Marks.

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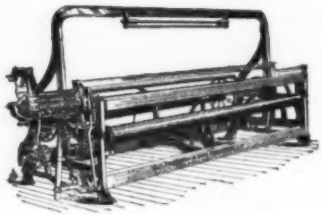

Blanket Loom, No. 128.

A WORD ABOUT LOOMS.

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Our pattern No. 128 is a strong, substantial loom of best material, and adapted, with modifications, to weave blankets, table covers, paper makers' felt and heavy cloth.

Our standard widths are 49, 92, 100 and 115 inches, reed space.

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Knitting Machine. 604,570. J. E. Rowe, Assignor to E. Jenckes Manufacturing Co., Pawtucket, R. I.

Knitting Machine. 605,065. C. Terrot, Cannstadt, Germany, assignor to M. Boas, St. Hyacinthe, P. Q., Canada.

Knitting Machine. Circular. 604,646. L. N. D. Williams and H. Swinglehurst, Jr., Philadelphia, Pa., assignors to said Williams and R. W. Scott, Philadelphia, Pa.

Knitting Machine Cylinder. 604,440. E. Vermilyea, assignor of one-half to S. Snyder and J. Metcalf, Waterford, N. Y.

Knitting Machine Loop Cutting Attachment. 605,873. S. T. Harshaw, Lansingburg, assignor of one-half to Campbell & Clute, Cohoes, N. Y.

(Continued on page 126.)

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ELIZABETH E. BOIT.

TEXTILE WORLD.

Vol. XV. JULY, 1898. No. 1.

ELIZABETH E. BOIT.

Elizabeth E. Boit was born in Newton, Mass., July 9, 1849. She attended the public schools until her graduation from the grammar grades, when she passed two years at the Lasell Seminary, Auburndale.

At the age of eighteen, Miss Boit entered the Dudley Hosiery Knitting Mill, H. B. Scudder, agent, at that time. Her first employment was timekeeper for the girls in the sewing or finishing room, in which she took an earnest interest. She was soon advanced to the position of assistant forewoman, and, within a short time, to that of forewoman. Within five years' time she had the full charge of the finishing department, which position she held for several years.

When agent H. B. Scudder left the Dudley Mills and established a mill at Allston Mass., known as Allston Mills, to manufacture children's scarlet-wool goods and hosiery, Miss Boit was offered and accepted the position of superintendant of his mill, which place she held for five years, at which time the business was sold out. Miss Boit then decided to go into business with a young man, Charles N. Winship, who had been associated with her at the Dudley and also at the Allston Mills where he was foreman of the knitting room.

Miss Boit and Mr. Winship started with a small capital, but each with a thorough knowledge of their respective departments; Miss Boit assuming the financial part of the business and the general supervision of the finishing. Their one aim was to make the enterprise a success, and to place goods on the market that would be a credit to themselves and to American industry.

The growing demand and popularity of the Harvard Knitting Mill underwear speaks for itself. An illustrated description of this mill is given elsewhere in this issue.

Miss Boit has always had a personal interest in all the girls in her employ, both in the factory and outside. She has always, from first, felt a great interest in girls, and in all public charities.

Since she has been in business Miss Boit has been a very busy woman, but has always found time to associate herself with all the local interests of the town in which she is a resident. She is treasurer for the Aged Women's Home in Wakefield, also for the Kosmos Club, a ladies literary club.

Lowell Textile School.

The Lowell Textile School, Lowell, Mass., closed its second year's work, the first week in June. Many of the pupils exhibited great skill in the performance of their work, which was amply shown in the exhibition that was made at the school. The school closed with an attendance of about 200 students. At the exhibition of the work done by the students, the designing department was well represented by a large number of designs and patterns produced at the school, under the care of Prof. F. Umpleby. The work of the art department, under the charge of Prof. George, was particularly attractive, and some elegant designs for printed fabrics and jacquard weaves were shown.

The sketch books of the pupils, showing the instruction that was received at the lectures given on "Cotton," by Director C. P. Brooks, indicated proficiency and excellent conception of the subjects. A fine exhibition

was shown of woven fabrics, including ginghams, towelling, dress goods, jacquards, lappets, and other cloths. This last work was under the immediate charge of Instructor Nelson, during the greater part of the year. A fine exhibit was made from the department of chemistry of dyed fabrics, but owing to the fact that the students devoted their attention principally to chemistry during the last winter, results of their work were not so great as they will be next year. This department has been under the charge of Prof. L. S. Olney, and has had an attendance of as many as seventy students.

The wool and worsted department and department of mechanics and machine drawing, respectively, under the care of Prof. E. H. Barker and W. W. Crosby, also showed some excellent work, the machine drawing being very fine. During the year the machine that was selected as a test for the students to show their skill in making scale drawings and assembles of drawings, was the Mason plain loom, and tracings and blue prints of all the parts of this loom were shown in great profusion.

The equipment of the school is now practically complete and all the departments during the last term have been in full operation and working as smoothly as though the school had been in existence 20 years.

Hand Spinning.

Domestic spinning, except in its modern revival, is treated by T. Blashill, of the British Archæological Association, as a lost art. Although it went out in England some fifty or sixty years ago, and in the United States a little later, it has become as completely forgotten by the world as if it had been for centuries unknown. Spindle whorls have been discovered from time to time in deep excavations; implements used in spinning may be seen in the most ancient Egyptian sculptures; and spindles with the whorl attached are found in Egyptian excavations; so that we have means of acquainting ourselves with the conditions of the art in all ages. In hand spinning with spindle and distaff there has been no progress through all these ages, and the most ancient specimens extant might be used by women who in remote countries practice hand spinning to-day. The great wool wheel was in use as early as the fourteenth century and lingered on in Wales down to recent times. The ordinary spinning wheel was known as early as the middle of the sixteenth century, and was at first turned by hand and afterward by the treadle. The earliest spinning wheel extant in England is believed to be in the British Museum, and is of the fourteenth century. In former times the art of spinning was a necessary accomplishment for women and girls, and perhaps its use was rendered more popular by the idea that it promoted grace in the female form. In the year 1721 an aged lady left considerable property to endow a school for spinning. The art was practiced in England in the drawing rooms and servants halls of country houses as late as 1830. Rabbit wool is spun at Aix in Savoy at the present time. Statements were made, after the reading of Mr. Blashill's paper, that the spinning wheel is still used in Sutherland; that "homespun" is made in the Isle of Lewis; and that the Bedouins in spinning use their fingers and no distaff.

—Is the revival of hand weaving desirable or possible? The question itself implies a time when handloom weaving not only existed but flourished, and that under changed conditions it has perished.

—The Canadian Government has asked the Dominion Parliament for a grant of $40,000 to assist in establishing a direct steamship line to Manchester.

—Arrangements are being made to hold auction sales of wool in Brisban, Australia, next season, and these, it is expected, will commence in September.

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Manufacturing Clothiers,
Suit and Cloak Makers,
Jobbers and Large Retailers,
Buyers from First Hands.

Special quarterly issues are published in January, April, July and October; one (January) being a statistical issue, and the others devoted especially to the cotton, knitting and woolen branches, respectively.

TAXATION OF MILL PROPERTY.

The taxation of manufacturing plants in New England, especially those devoted to cotton manufacturing, is becoming one of vital importance to our New England industries. Southern competition in the manufacture of cotton fabrics has now become so keen that all just complaints against unnecessary taxation imperatively engage the attention of those who have money invested in such enterprises. An important case is now being tried in regard to the valuation for taxable purposes of the Amoskeag Mfg. Co., Manchester, N. H. This company requests the city of Manchester to make an abatement on the valuation of the property for taxable purposes, to the amount of over two million dollars. It is not a simple question whether the valuation in too high or not, in itself considered, but whether the taxable valuation is in the same proportion as that applied to other properties in the city. The appraisal of the company's property made by the assessors of the city, amounted to six million dollars. This appraisal, we understand, is satisfactory to the corporation, based on the market value of the capital shares (4000 at $1500). But it appears in the testimony that while the assessors taxed the corporation upon the full value of its property, they taxed other city properties but 60 to 70 per cent. of their true value.

It is a great mistake on the part of any manufacturing community to over-tax its industries, or to tax them out of proportion to other properties subject to its jurisdiction. Nothing is more likely to discourage the extension of local enterprises, and to encourage the investment of capital elsewhere, where taxation is more equitable adjusted.

This matter of taxation was never better presented, so far as we know, than in the paper read by E. W. Thomas, agent of the Tremont & Suffolk Mills, Lowell, Mass., on "Valuations of Mill Property," at the October meeting of the N. E. Cotton Man-

ufacturers' Association, held at Philadelphia, in 1897, and published for the first time in this magazine. "For taxable purposes," Mr. Thomas said, "no specified valuation should ever be placed on an individual machine of the mill plant, for it is simply part and parcel of a unit for productive purposes, and said unit should be considered as a whole. It matters not what the machine originally cost, but it does matter considerably whether the whole plant, with its buildings, power, tenement property, proximity to accessible freight facilities, nearness to labor market, is a good, bad or indifferent tool with which to manufacture with economy. Local taxable valuations too often are based on the amount of machinery and other tangible property. Its valuation as taxable property should be based on its market value, productive capacity, dividends earned, and not on cost, or what it may have done five years before." As stated by the corporation's counsel, in presenting his side of the case: "It is of no consequence to any tax payer whether his property is appraised at its full value, 50 or any other per cent. of its value, provided all other property is taxed in the same proportion." This rule, the corporation declares was not respected by the assessors, hence the complaint. Mr. Thomas commends the way of valuing mill property in Massachusetts, where the State tax commissioner has particular rules laid down for his guidance in levying the State tax, and the most important is that based on the selling price of the stock, as on May 1 of each year, taking the number of shares of the capital stock and multiplying by the market value on this date. From this amount is deducted the surplus of the company, if any, and the balance is said to be the value of the taxable property in the city or town in which the mill is located. Whether this is a proper criterion for the valuation of any property, is a debatable question. From present appearances it looks as if the city of Manchester has attempted to do an unfair thing with its principal manufacturing industry, and has taken advantage of its power to tax without regard to its equitableness.

THE COTTON BALE.

We have had more or less to say in these columns concerning the efforts in late years, of improving the methods of baling cotton, and its transportation to its destination. Whether the oblong, or so-called square, form will be relegated to the past, is still a problematical question. It is very clear, however, that there are strong competitors for favors with this bale, which promise much success in ameliorating conditions affecting the proper packing and handling of cotton, if it does not bring about a complete substitution.

A great deal of money has already been put into mechanical devices for making cylindrical bales and for educational purposes to induce planters and operators in cotton to favor such a form. These inventions are, as was to be expected,strongly combatted by those who have invested capital in other methods of baling.

The principal things to be attained are density, or compactness, and proper covering, in order to reduce the cost of transportation, and keep the cotton in a cleanly condition and safe from pilfering. The compression of cotton to any practicable density does not injure the fibre in the least. This has been, we believe, satisfactorily demonstrated by a number of scientific examinations of fibres that have been subjected to extreme compression. A wrong idea is entertained by many, that a density of 40 to 50 pounds per cubic foot, is sufficient to exhaust or drive the air out from any mass of cotton. With the specific gravity of cotton at 1.55, absolute solidity would mean a density of 96⅞ pounds per cubic foot, and the difference between this and the real density is so much air.

The consensus of opinion concerning the proper length of a cotton bale, whether square or cylindrical, is that it should be 36 inches, so that two

bales can be placed one above the other in an ordinary box car, which has an average height of 6½ to 7 feet. Not only should the length be uniform, but the width, or diameter, also, for an economical utilization of space. This uniformity of dimension is one of the chief values of one of the round bales which are now being pushed upon the market.

The cost of transportation is determined by density, and when a sufficient quantity of the cotton crop is put up into bales of forty pounds to the cubic foot, the freight cost will undoubtedly be lower, but the lowering of this cost will have to be where it properly belongs, with the initial lines of transportation. These must make the first move, as they readily can do, with the round bale, for example, as they can receive a bale at the first point of shipment, and take it without unloading, compressing or reshipment, till the cotton reaches the main lines east of the Mississippi, as at St. Louis, Cairo, and Louisville. We doubt very much if any material concessions can be obtained on the railways east of the Mississippi River, but there should be concessions south of this line.

With greater density, the fire risks will be lessened, and insurance rates will become lower when there is sufficient quantity shipped to warrant any change. Of course, it cannot be reasonably expected that freight and insurance rates will be adjusted to new conditions until a sufficient amount of the cotton crop is put up in bales according to the new or proposed standard of compression.

In order that the planter shall become interested in any innovation in the baling of cotton, he must be made to realize that he is receiving no less compensation for his product, and that it will be more favorably received than when put up in the old form of baling. The spinner is interested in this subject, not so much for any gain that he will make in the cost of his cotton at the initial point of shipment as the saving in the amount of freight and insurance that he will be obliged to pay, and in the better condition in which he will receive his coton, with greater dependence upon obtaining full weight. There are spinners who are willing to pay ¼ of a cent more for cotton put up in the new round bales than in the old square one. The well known cotton merchant of the South, S. N. Inman, Houston, Texas, has written a letter to parties interested in one of the new cylindrical forms of bale, to the effect that he is ready to pay 4/10th cent more for cotton put up in the round form than that put up in the square form. This proposition stands good for the season of 1898-99. This increase in price seems large, based upon five-cent cotton at place of purchase, reckoning 24 pounds tare on the square bale. Mr. Inman must reckon a saving in the cost of insurance and transportation, and an improvement in the condition of the cotton.

MERCERIZED COTTON.

We made mention in our May issue of a case likely to come before the Board of General Appraisers, concerning the classification of cotton cloth that had been mercerized. The case came before the Board, which has rendered a decision to the effect that manufactures of cotton that have been mercerized are subject to a rate of duty as "colored" goods.

This is the first instance in the history of the tariff, we believe, where a definition has been attempted of the word "colored." The decision as made by the Board was written by Appraiser Tichenor, whose opinions upon such questions are regarded as particularly sound, and as a result of an impartial weighing of evidence. The decision in this case will meet with the approval of the American manufacturer, as consistent with the general principle or cardinal idea as expressed by Mr. Tichenor, which "pervades the present tariff act, as that of protection to American industries." This idea, as stated by Mr. Tichenor, "is nowhere more consistently adhered to than in the respec

tive paragraphs and provisions relating to cotton cloths, the rates of duty thereon being scientifically adjusted according to the condition or amount of labor and expense involved in the several stages of their treatment as commercial articles."

There are several points in the decision that are open to question, treating upon a method of manufacture that may be denominated entirely new to the industry, though based upon a discovery made more than fifty years ago, by one John Mercer, who made use of it in patenting a method by which it could be brought into commercial use, in 1850. The utilization of this discovery has not been of practical value to manufacturing until within a very recent time, and almost, we might say, within the last twelve months, and subsequent to the passage of the present tariff law.

No textile paper has given so much consideration to the subject of mercerization as the Textile World. Some most valuable articles have been published in this magazine on this subject.

We desire to call attention to the testimony before the Board of General Appraisers made by Dr. Baker, chemist in the government laboratory, who stated, in substance, that the color in the warp of the goods was imparted by an "insoluble and inextractable coloring matter, inherent in the fibre, which was developed in the process of mercerization by the action of caustic soda, which changed the physical construction of the fibre." Dr. Baker also stated that in his examination he was not able to discover the presence of any added dyeing or coloring material, and "that caustic soda would not in itself impart a color to the cotton fabric, but would rather tend to extract or remove color, and, in that sense, to partly bleach." This statement of Dr. Baker will be read with profound interest, that there is a coloring matter inherent in the cotton fibre, a fact that we believe has never before been discovered or asserted by any scientist. If there is a coloring matter inherent to the cotton fibre, it is something new, and Dr. Baker is the first one we know of that has made such a statement. He further says that caustic soda does not in itself impart a color to cotton, which agrees exactly with our statement made in the May issue, but that this alkali does have an action of some kind in developing the coloring matter which he says exists inherent in the fibre. Here is something that chemists would do well in taking up for investigation, and if there is any existing coloring matter in the cotton fibre that can be developed, in any form, it ought to be known and its nature and characteristics defined.

We are informed by the importers that they have no present disposition to appeal to the courts, but that they prefer to abide by the decision of the appraisers, due chiefly to the expense and trouble attending an appeal of this kind. They seem satisfied, however, that the decision could be reversed.

FILLED AND COATED COTTON GOODS.

The changes in the phraseology of the new tariff law, as compared with its predecessors, are bringing out new decisions upon the part of the Board of General Appraisers. A recent importation of a somewhat coarse cotton cloth, known as Scotch Holland, has been classified under the new paragraph 311, of the present tariff act, as cotton cloth filled, and not under the countable clauses of the cotton schedule. This provision is entirely new, nothing like it appearing in previous acts. The real point of contention in this decision was whether starch alone constitutes filling. The Board decided that it does. This decision of the appraisers places goods of this kind at a higher rate of duty than would be the case under the countable clauses. The meaning of this clause in the tariff can be inferred from the discussion that was made in the open Senate, at the time that the bill was before it, when Senator Chilton asked Senator Allison, who had charge of the

bill, its meaning. Senator Allison replied that it was intended to "cover particular kinds of cotton cloth that we find in our houses, what we call curtains, . . . to increase the protection of the class of cotton cloths filled with oil or coated in some way, ... to protect that class of cotton cloth which has oil in it, or which is coated." This clause did not appear in the bill as reported by the ways and means committee, nor did it appear till the bill was reported by the Senate Finance Committee, as an amendment. Senator Aldrich says that the provision referred to, relating to filled or coated cotton cloth, was inserted to cover goods like Holland window shades, and was put in the bill at the request of a considerable number of manufacturers of fabrics in this country, upon a statement that the regular rates did not sufficiently cover this class of goods. General Appraiser Tichenor dissented from the opinion of the majority of the Board, upon its classification. We think very likely that the case will be brought before the courts before it is settled. Were it not for this clause in the cotton schedule, we think that there would be no question as to the classification of such goods under the countable paragraph, assuming, of course, that the threads could be parted and counted.

OUR TRADE WITH CHINA.

The commercial commission that has been sent to China by the Philadelphia Museums, is sure to work great benefits in extending the trade of this country to the interior of China, and making the Chinese become familiar with the superiority of American products. This commission consists of three gentlemen, experts in their particular lines, receiving the endorsement of the Department of State, Washington, with letters to United States officials in China, for the purpose of securing admission to all parts of the Empire, under special privileges to be obtained from the Chinese Government. The report of this commission will be especially valuable, as giving a series of observations such as has never before been the privilege of foreigners to obtain under the official sanction of the Chinese Government. The principal point from which the commission will start is Shanghai, as being the chief point in that Empire for the distribution of foreign imports, as well as the point of accumulation of native goods intended to be sent abroad. The commission will thence follow the Yangtze River to the city Chungking, which is the limit of navigation of this waterway. Thence they will proceed to the capital of the rich province of Szechunan, thence to Han-Chung, thence down to the mouth of the Han River, thence over a line of railway now under construction, to the capital of the Empire, and thence through the eastern provinces, returning by the way of Shanghai. Anyone who will take the trouble of tracing this route on the map will see that the commission proposes to travel one thousand miles from the coast into the interior, and through the very heart of the country. Large collections of raw material and manufactured products will be secured and forwarded to the Philadelphia Museums; also, samples of articles that are imported into China from other countries, in order to show, in part, the internal and external wants of the people. Information of immense value to the commerce of the world must be the result of this work.

WAGES AND PRICES.

The Massachusetts Bureau of Statistics of Labor has just issued advance sheets of a portion of its 28th annual report, covering the comparative wages and prices, 1860-1897. Some of the figures given in this report are of interest to our readers, as showing a general increase, not only in wages but in the purchasing power of money. In some industries the wages are lower. The dates for comparative purposes that we shall assume are 1881 and 1897. Wages were higher in 1897, in the building trades,

boots and shoes, and printing, and lower in the ready-made clothing trade, knitting mills and machine shops. Wages were but slightly higher in the cotton and wool manufacturing industries. To determine, however, whether real wages have gone up or down, the price of commodities should be taken into consideration and the purchasing power of money. The articles classified as groceries showed lower prices in 1897 than in 1881, with the single exception of Rio coffee. Provisions also showed lower prices, in general, the exceptions being certain grades of beef, veal cutlets and mutton chops. Dry goods were lower, and this, of course, included all lines of cotton manufactures. Rents were slightly lower for six-room tenements, in 1897 than in 1881, but for four-room tenements, the figures showed a slight increase. Flour was 33 per cent. less in 1897 than in 1881; sugar was nearly 50 per cent. less; beef 14 per cent., with the exception of that for steaks, which was 27 per cent. more; butter was 30 per cent. less; eggs, 28 per cent.; coal, 23 per cent.; and dry goods, from 20 to 30 per cent. less, and so on.

SHEEP IN THE SOUTH.

If there is anything that the farming population of the South should give immediate attention to, it is the raising of sheep as an adjunct to their farming operations, in line of economy with the purpose of bringing up the condition of their lands by increased and equalized fertilization. It has been demonstrated time and time again that agriculture and sheep husbandry should go together in proper proportion. Sheep not only pay for themselves in the mutton and wool that they furnish, but in the improvement that they give to the land upon which they feed.

Opinions differ as to the best breed of sheep for the Southern States, but the views of those experienced in Southern sheep husbandry seem to favor an animal that is mutton producing rather than wool producing. An old experienced sheep man of South Carolina has written to one of his local papers on the subject, and suggests, as the result of his own experiments, that there is no better sheep for any purpose of this kind than the African broad-tail variety. Experience with this sheep has not been very extensive in this country; rather it has been very limited, but wherever it has been tried it has given satisfaction.

C. P. Bailey of California, well known as a raiser of Angora goats, has given his attention, in recent years, to the raising of the Asiatic varieties of sheep, among which may be named the broad-tail; and, from his experience, he has written us that they answer many wants which are not filled by any other breed of sheep. Mr. Bailey's idea is to make a cross of the Asiatic sheep on the native varieties until the former blood is thoroughly impressed.

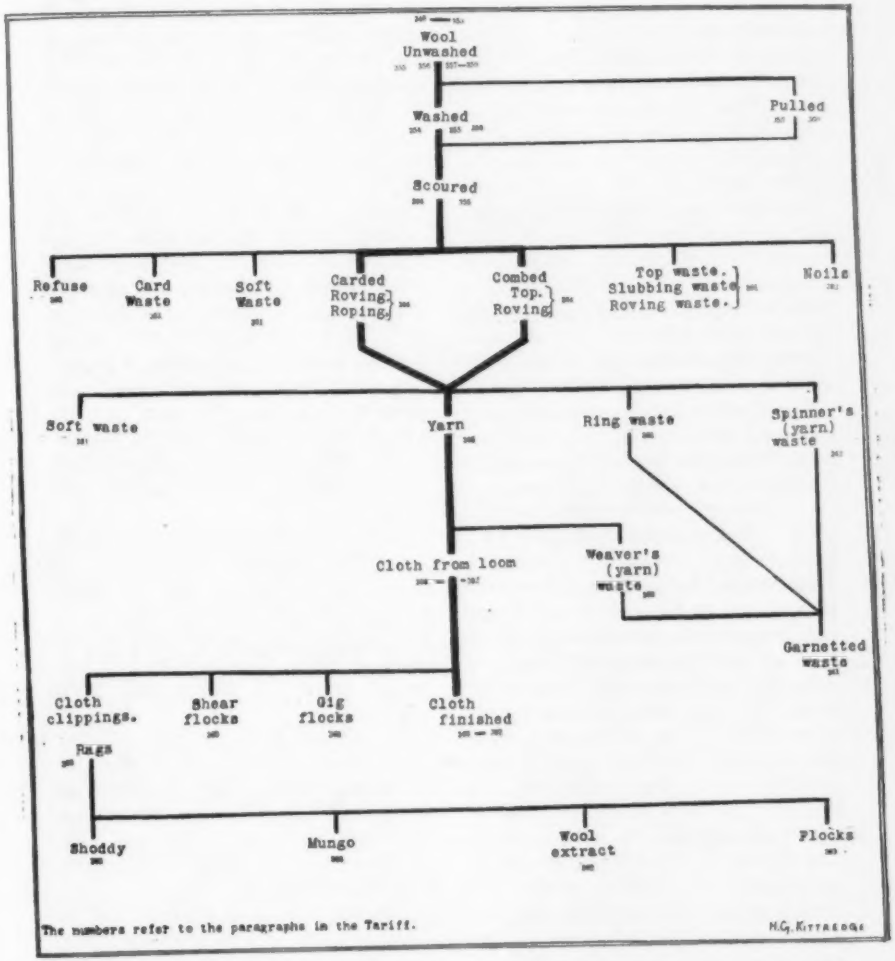
We think it would be well for Southern farmers to look into this matter, not only in its broad aspects, but into the specific characteristics and merits of the Asiatic varieties.

The conference report on the sundry civil appropriation bill has been adopted by the House and Senate, Washington, which carries with it an appropriation of $650,000 for the representation of the industries of the United States at the coming Paris Exposition. Although this amount is none too large, still it is probably sufficient to enable this country to make a creditable exhibit of its varied industries and resources. Whoever is appointed as commissioner-general will be one possessing ample wealth to carry out the social requirements of such a position.

That old conservative ideas must go to the wall, and newer and more scientific methods take their place, is a fact that is now beyond question.

The Wool Tariff.

We give, herewith, a chart, which, to the wool manufacturer, is self-explanatory, showing the direct connection of wool with the finished product, in the several processes of manufacture, and also the by-products that are made during these processes, and which are subjects of tariff legislation. It serves as a diagrammatic exposition of the tariff relating to wool. The figures on the chart refer to the several paragraphs in the tariff act under which the products named are classified. The heavy lines show the direct descent of the finished fabric from wool, and they also show the distinction between worsted and woolen, so called, which merely consists in the employment of two different processes—combing, carding. These two names give, unfortunately, an erroneous impression to many—that there is a difference between a worsted and a woolen yarn other than the simple process of preparing the wool and the arrangement of the fibres for spinning into yarn. The yarn is a manufacture of wool, whether carded or combed, and so with the finished product.



The paragraphs under which the products named in the chart come, are as follows:

Wool Unwashed; 355, 356, 357-359.
Washed; 354, 355, 356.
Pulled; 355, 360.
Scoured; 354, 355.
Carded—Roving, Roping; 364.
Soft Waste; 361.
Card Waste; 362.
Refuse; 362.
Combed—Top, Roving; 364.
Top Waste, Slubbing Waste, Roving Waste; 361.
Noils; 362.
Yarn; 365.
Ring Waste; 361.
Spinners' (yarn) Waste; 362.
Cloth from Loom; 366-382.
Weavers' (yarn) Waste; 362.
Garnetted Waste; 361.
Cloth Finished; 366-382.
Gig Flocks; 363.
Shear Flocks; 363.
Cloth Clippings and Rags, 363.
Shoddy; 362.
Mungo; 363.
Wool Extract; 362.
Flocks; 363.

Argentine Wool.

There has been some interesting rulings of late on the part of the Treasury Department, Washington, in regard to the proper classification of Argentine wools that are imported into the United States. There has been some confusion as to the real condition of these wools as imported prior to 1890, which would affect the rate of duty upon them under the clause of the tariff relating to skirted wools. The Treasury Department is pretty well satisfied that these wools were skirted prior to 1890, and in that condition imported into this country, thus subjecting them to single duty only, and not double duty, as otherwise would be the case. Daniel S. Pratt, a well known wool merchant in Boston, who is as familiar with these wools as anyone in this country, has written very interestingly of late in regard to them and their tariff classification, to a Boston publication, as follows:

"While it is quite true that there is a great falling off in the importations this year, and that our manufacturers have learned to like the Argentine wools, and to work them so as to produce fabrics in competition with articles made abroad from the same raw material, it is not true that they are "hampered by the classification." The classification is all right, and it doesn't exclude a bale. It is that portion of the Dingley law which is termed "the skirting clause," and its application by the United States appraisers—notably those at Boston—to Argentine skirted wools, that hampered the importation of those wools this year, and which created a discrimination against the skirted wool of the Argentine Republic, and in favor of Australian and other English colonies; as also in favor of little Uruguay, just across the river. The question of double duty on washed wool does not apply to Argentine wool, for it never is washed. the sheep are not washed in that country, and the wool always comes to market in strictly unwashed condition, just the same as our own Kentucky wools are sold.

"As the Dingley law was applied to Argentine skirted wools—prior to the recent ruling by the honorable secretary of the treasury—they were subjected to 'double the duty of the class to which they belonged' if imported after the fleeces had been skirted.

"At present, however, the collector is instructed to pass them at the single duty of eleven cents per pound as of class 1, for they are of merino blood near or remote, also, and such as have been heretofore imported from Buenos Ayres."

"I should explain in passing, that in the early years of wool growing in the Argentine Republic, the clip—aside from the Criolla and Cordova carpet wools of class 3—was wholly of merino and Saxony blood. In this period the States made large importations.

"About 1885, however, Lincoln blood was extensively introduced, and crossed with the Rambouillet-Merino;

and in 1888, twenty per cent. of the clip was of this Lincoln-Rambouillet cross. Today, fully seventy-five per cent. of this clip is what is called Lincoln crossbred—a wool very similar in staple and in fibre to much of the Australian and New Zealand crossbred wools, but not yet advanced to the same point of excellence they have attained.

"When it became necessary for our United States appraisers to act upon skirted Argentine wools arriving after the Dingley law had become operative, there were no "standard samples" (within the meaning of the law) at our custom houses representing the Argentine wools of the present time; and as little, if any, had been imported from 1868 to 1892, the appraisers were not familiar with the wools of today nor the customary methods of handling the fleeces in Buenos Ayres—hence they claimed that such wool should pay the double duty of twenty-two cents per pound as of Class 1. This was, of course, prohibitive of business—and of customs revenue as well. While in Buenos Ayres during the past wool season, I made a very careful investigation of this skirting question, and in January of this year I had the honor to present to Hon. William I. Buchanan, United States minister, a certificate signed by eleven of the oldest and most important wool exporting houses in that republic, proving beyond any question that the custom of skirting the fleeces had been in vogue from 1886 up to and at the present time. None of these houses have been established less than fifteen to twenty years at Buenos Ayres, and many of them have been actively handling wool there for thirty to forty years.

"As to the reason for the falling off in imports: The first great check to business was in the application of this skirting clause. Early in this season there were many wools that it would have been profitable to import at eleven cents duty; but the double duty of course shut them out.

"The importation of wool into the United States last year was phenomenal. Boston became for the moment the largest wool market of the world, the sales here exceeding by some millions of pounds the year's sales at London. The American mills had filled their storehouses with a supply of raw material for a year or more, which came in free of duty and at a low average cost; hence they were indifferent about buying more. Later on some speculators began to unload, and the market grew weaker, so that there was then no margin that warranted importations. This lack of margin was increased by the active competition at Buenos Ayres between Germany, France and England, who carried values of the finer grades quite high, also by the decline in gold, which ruled much of the time during the height of the season at about 252 to 263, against 285 to 330 same time the previous year. As all purchases are made in paper dollars, this fluctuation in gold was a serious element in the cost, so that while the first cost was nominally a fraction less in some instances, the real net cost was usually pretty well up to last year. These are some of the practical reasons why we took only about 3000 bales this year, against 52,000 last year. Now that our manufacturers are learning how to handle Argentine wools and to like them, as you are quite right in saying that they do, we should under normal trade conditions take at least 60,000 to 70,000 bales to supply what we lack here at home. The American wool grower never has, does not now, and probably never will raise enough cross-bred wool to supply his home market, and as our mills must get that class of wool somewhere, the wool grower and the consumer and all concerned will, I think, be better satisfied if Argentine wools are given a favorable standing at the custom house than if Australian is made the only crossbred that can be imported. Argentine mixes well and works to advantage with Kentucky and other American wools and gives cheaper goods. Australian is more heavily skirted, higher priced and dearer in the cloth."

The Cotton Bale.

From quite a number of communications from Southern correspondents, we take the following notes relating to the commercial form of cotton bales. A New Orleans correspondent writes us that the 24x54 gin box has been adopted as a standard in the States of Texas and Arkansas, and also by the New Orleans Cotton Exchange, and, in his opinion, it is only a question of a very short time when this standard is adopted by the cotton States of the South.

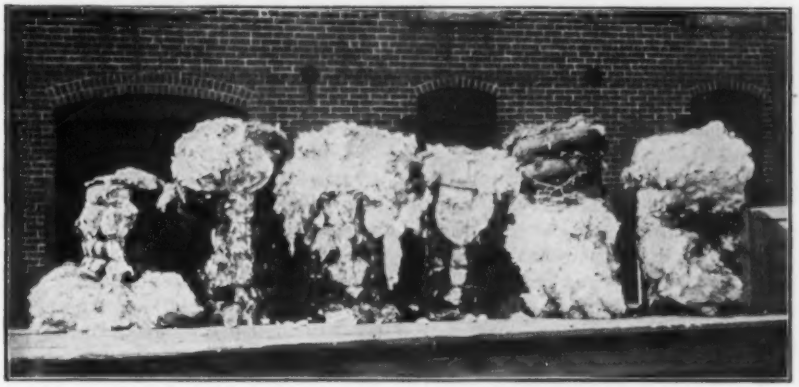
W. C. Dotterer, vice president and general manager of the New Orleans and Western Railway, writes us that a large amount of cotton, tributary to the port of New Orleans, reaches his railroad by boats from the Mississippi River and its tributaries, and often times such cotton remains on the banks for weeks at a time, awaiting shipment, taking all kinds of weather. He is satisfied that a good many bales are damaged in process of baling, on account of cotton being packed damp, and in this respect, he says that the cylindrical bale is much at fault. He does not express himself favorably concerning the round bales, such as have been put upon the market, as they are not of uniform size, as frequently asserted, nor of uniform density. He says that the round bale is unpopular with steamship agents, as it is simply impossible to screw them into the hold of ships, resulting in a large amount of lost space and making it very dangerous from an insurance standpoint, because of the many openings between the bales for numerous air passages.

Another correspondent writes in regard to the cylindrical bale, which, in our references, means the bale turned out by the American Cotton Co., that it does not find favor with the local merchants of New Orleans, from the fact that the packages cannot be properly sampled and subjected to the usual inspection that is essential in the trade. Moreover, he says that it suffers severely from any exposure to the elements, which will be almost a necessity under the present conditions existing. A strenuous opposition is developing towards it, because it would mean the subversion of large invested interests, and in time the total annihilation of their business. The commission merchants are represented as united in their condemnation of this package as a commercial bale. The exporter and buyer object for the reason that as a pre-requisite to his purchase, he must be enabled to thoroughly inspect and sample the cotton he has bought, to see that it confirms his purchase and is free from mixture and false packing. The matter of insurance is undetermined up to the present time, as there has not been a sufficient number of bales so far handled in New Orleans to give any definite data regarding their position in this particular, but in respect to marine insurance it is regarded as a more hazardous risk, because of a likelihood of their becoming a shifting cargo, and in the event of fire, the open spaces between such packages furnish a draught that would effect its destruction. This correspondent adds, significantly, that when "you stop to contemplate the combined opposition embraced in the planters, commission merchants, exporters, shipping interests, and also the gin men, packing and tieing interests, also the cotton compress men, all of which are so closely identified, you can readily see that without some special merit to recommend it, the American Cotton Company's bale will have a hard 'row to hoe'." He admits, however, "that this innovation in the packing of cotton has resulted in promoting the standardizing of the square bale."

We have before us the report of the chairman of the special committee, appointed to investigate and report upon the best method of standardizing the size of cotton bales, to the president of the Board of Directors of the New Orleans Cotton Exchange. This committee came to the conclusion that "the best results, both in uniformity of packages and density of compress-

ing, as well as the convenience and economy in handling, can probably be obtained by the adoption of a gin box 24x54 inches in size." This committee unanimously recommended that necessary steps be taken to try to have adopted throughout the cotton growing States, a uniform sized bale of 24x 54 inches.

The Savannah Cotton Exchange has also taken action in regard to the subject of cotton baling. The directors of this exchange have endorsed the report adopted by the convention of "The Interior Compress Association," in No. Carolina, Georgia, Alabama and Mississippi, and have urged the spinners and ginners to adopt the 24x54 press-box, and have recommended that the necessary alteration be made in time for the next crop. It is admitted all around that the American cotton bale is now delivered at its final destination in a dirty, ragged condition, and on account of its condition, the cotton consumers are discriminating against it. The Compress Association, just alluded to, recommend a commercial bale packed in a rectangular box of uniform size, and so perfectly wrapped in stout bagging and bound with strong ties that it will reach its destination, wherever shipped, in a good and clean condition. The action of this association was prompted very largely by the doings of the cotton growers, in their organized capacity, in Texas. The reason why a press box, 24x54, was recommended, was founded upon investigation and experiments in Texas, that cotton packed in boxes of these dimensions showed an average density, after pressing in an ordinary press in the usual manner, and at the regular rate of speed, of about forty pounds to the cubic foot. It was not apparent, at first, to the committee of the compress association, why so slight an alteration in the size of the bale should make so great a difference in its density, but the mathematical demonstration is, after all, quite simple. The records of the Maritime Association at Galveston, Texas, show that bales made in 28 by 58 inch boxes, after compression and delivery at that port, average 32 by 62 inches, giving a superficial area of 1,984 square inches, whereas the bale made in boxes 24 by 54 inches average at Galveston 26 by 56 inches, or 1,456 square inches. The pressure of the compress in both cases is the same, namely, 1,800 tons, or 3,600,000 pounds on the bale; therefore, by dividing the area of the bale in inches into the pressure in pounds, we find that there is 658 pounds greater pressure per square inch on the smaller bale than on the larger one. The remarkable increase in density produces no increase whatever of strain on the gin press boxes or machinery, as is demonstrat-



LOT OF COTTON RECEIVED AT THE OTIS CO.'S MILLS, WARE, MASS.

ed by the fact that all of the 24x54 inch cotton made in Texas was turned out by boxes which had been used the entire past season in making bales 28 by 58 inches, and no alteration whatever was made in them, except to line them up with 2-inch planks, and cut down the fellow blocks, nor was any additional steam used. To conform with this standard, however, the committee stated that the average weight of the bale would have to be reduced somewhat. It was also found that by exact demonstration at a compress that a bale packed in a gin box size 24 by 54 and 116 inches in depth, weighing say, 500 pounds, will measure in the jaws of the compress 10 by 25 by 55 inches. After it is released from the press it will measure, if tightly tied, 14 by 25 by 55 inches, expanding only 4 inches in depth. A bale of the same weight, packed in a gin box 28 by 58 by 116 inches, will expand, after coming out of the compress, 10 inches or more in depth on account of inability of bands to hold it in original compressed condition, the width being too great as compared with the thickness.

The Dyeing of Shoddy.

G. E. Hoelz writes in one of our exchanges that there is no more difficult branch of dyeing wool than that of dyeing shoddy, especially when in the loose condition. This of course is brought about by the very heterogeneous nature of the article manufactured, as it is from woolen tissues of all kinds and colors. Moreover it contains cotton, the proportion of which is unknown and may be large or only small, but still has an appreciable effect on the nature of the dyeing operations. As presented to the dyer shoddy is of various colors, sometimes black, at others of a dark brown, then slaty, perhaps dark red or may be dark green, while others are of a mottle character from the presence of fibres of a variety of colors. In regard to what can be done with such material, the shoddy dyer must bring to bear that knowledge which is born of experience. Naturally he cannot expect to dye light or bright colors on shoddy that is already of a dark color, although he may successfully dye bright shades on a light colored shoddy and dark shades on a dark colored shoddy. Although much may be done in the way of attempting to destroy or discharge color from shoddy, yet too much cannot be done in this direction, for the dyer must have some regard to preserving the nature of the fibre, and violent attempts to destroy color from shoddy might result in the destruction of the material itself. Boiling with 3 per cent. of bichromate of potash and 6 per cent. of sulphuric acid is a good plan; there is not alone a discharge of the color but mordanting of the fibre with chrome which is beneficial in many instances. Boiling the goods with 8 per cent. their weight of sulphuric acid is also a good plan, taking care to rinse well afterwards.

Boiling also with 4 per cent. of oxalic acid and 4 per cent. of sulphuric acid is a good plan. The dyer should, when he gets a batch of dark colored shoddy, test a small portion in each of these ways to see which gives the best results, and he will then be able to see what he can do with the batch he has before him. It is hardly necessary to point out that, after using these stripping baths, the shoddy should be well washed in water to remove acids. It might be worth while, before proceeding to dye light colored shoddies, to boil them up with soda to remove any grease they may contain and enable them better to take up the colors afterwards.

As shoddy may contain both wool and cotton, the shoddy dyer will find it worth while to use those colors belonging to the direct series of dyes, which will dye wool most satisfactorily, as such dyes also go on to cotton and will cover up very well any cotton fibres the shoddy may contain.

—Japan has completely driven Glasgow and Manchester umbrellas from the market of the Straits Settlements, according to a report by the Colonial Governor.

A Future for Cotton.

The United States Minister to Siam has written a letter to the American public and especially to Southern cotton growers, concerning the advantages that are presented in the vast population of Eastern Asia, for the consumption of American cotton, raw and manufactured. The minister asks: "Does the South appreciate her opportunity in the Far East? Does she realize that the mighty markets of Asia's millions await her best efforts at exploitation? If not, she should." He then goes on to say:

"The Far East wants the South's cotton; it wants a lot of it! It wants it now and it will want it more next year—and in ten years it will want twenty times what it demands now!

There are nearly 500,000,000 inhabitants of these lands—far surpassing the United States in area. The demands of these millions, though small individually, are vast in the aggregate, and are increasing with great rapidity. China is hardly awake yet. When she does move, look out for her. It will be like an avalanche! Of this half billion population, 350,000,000 wear almost nothing but cotton clothing, and use nothing but cotton materials for the hundred and one other uses that cloth is put to. The average Asiatic wears more clothing the more he progresses or comes into contact with foreigners."

"It is noticeable that the demand for cotton goods of all kinds has increased during the last few years far more rapidly than the population, and that sales are on an ascending scale, which means a brilliant future for the trade in cotton goods and raw cotton. The supply of raw cotton in China is so small compared to the total consumption of cotton goods that it could never meet the demand if supplies from other lands were cut off. It is true that China even exports cotton, but that goes only to Japan, and simply for manufacture, to be shipped back as yarn or piece goods. Then, again, cotton-growing is not a science in China, while the soil and sun do not seem to suit it like our own.

"The time may come when China's millions will learn how to grow all their cotton in China's numberless acres, but that day is so far distant as not to discourage the planters and manufacturers of the South in exploiting these Asiatic markets. Japan can never supply her own mills with the raw product, now over 100 in number and being added to every year.

"The tendency now of the Far East, illustrated by the development of cotton manufacturing in Japan with headquarters at Osaka and by the working and construction of numerous mills at Shanghai and other points in China, is to supply the market on the spot with the finished product instead of depending entirely on Europe and America.

"The only serious difficulty in the way of American cotton is the price, which is made high solely by the freight rates from the South to Japan and China. I have visited every cotton manufactory of any importance in those two countries, and wherever I found them using Indian, Chinese or Egyptian cotton the managers frankly told me that they would buy American cotton exclusively if the combined rail and steamer charges were not often prohibitive. The American cotton now shipped to the Far East is consumed by mills which have a special market, but they represent a small proportion of the total. In short, were freight rates favorable and did the Southern exporters push the market American cotton would monoplize the supply for the mills of trans-Pacific lands.

"The supreme advantage to be gained, which will, with "one fell stroke," accomplish the end desired, is the early construction and operation of the Nicaragua Canal. Unless that waterway is dug I cannot see how the South can ever win permanently even a fair share of this mighty Pacific trade, and that is the opinion of nearly all experts in the Far East whom I have consulted. A

trans-isthmian canal is the key to the trans-Pacific!

"The Far East, with uncounted millions to clothe and feed, and with wealth to pay for such clothes and food, invites the United States to supply her wants."

English Textile Designs.

The Textile Manufacturer, in one of its late issues, says that although it is ordinarily assumed that in the matter of textile design the English cannot equal their Continental competitors, those with a closer knowledge of the real facts take a materially different view of this matter. That in many cases the French and German designers produce superior work to that originated in England, it would be idle to deny, but on the other hand notice is taken of the reprehensible tactics of some of the Continental manufacturers, who in their endeavors to obtain British designs resort to all kinds of questionable tricks.

An instance of the fact that some of the large French manufacturers are not above annexing English designs was recently supplied by Professor Beaumont. A collection of the most finished styles of fabrics from French houses had not long been placed in the museum of the Yorkshire College, before a Huddersfield designer discovered that most of the patterns had originated in that district. Professor Beaumont was ready to admit that there were some branches of work, they must allow, in which they were neither equal to the French nor yet equal to the Germans, but in the great bulk of woven manufactures, especially in those finer cloths which were made for apparel, the patterns of English designers, their coloring, the cloths which they invented, and the style and finish which they applied, were all imitated by both Germans and French.

Referring to the suggestion that in England the tendency was towards economy of production, while in Germany it was rather towards variety and originality of design, Professor Beaumont pointed out that the foundation upon which England's great industry has been erected has not been one of cheapness, but one as far as possible of excellence. Therefore, whilst the English exercise in the textile arts the science of economies in mill management and in materials, there should always be an endeavor made to attain the very best results in color and in design. However much some manufacturers might be opposed to the idea, he was convinced that technical education could not benefit, and was not intended to benefit, the manufacture of cheap classes of goods for which no technical education was required. There is no doubt that many interested in technical education in its most popular sense will here join issue with Professor Beaumont, but at the same time there is no doubt that he is substantially correct in his statement. Technical education may prove of some benefit to the manufacturer of low-class goods, but its legitimate object lies more in the cultivation of skill in the artisan and in the development of a higher degree of artistic excellence in the work of the designers than in suggesting methods of producing cheap imitations of high-class goods.

Economical Gas Iron.

The Economical Gas Co., C. H. Sheftall, manager, have opened an office and repair shop at 305-307 Mercer St., New York. The office is located in the heart of the clothing district, and Mr. Sheftall is at all times pleased to have the trade call and see the economical gas iron which he has for sale, for the purpose of demonstrating its value in practical operation.

In presenting this iron to the trade, we desire to call the attention of all manufacturers of clothing, cloaks, and suits, shirts, shirt-waists, underwear, night robes, neckwear, felt, silk and straw hats, overalls, corsets, umbrellas, handkerchiefs, etc., to a few of the points of superior merit which the iron possesses.

The "Economical" is not an atmos-

pheric burner, but is operated by an air blast, supplied by a positive blower, and acts similar to a jeweler's blow pipe, forcing all the air into the flame that it is possible to consume with a given amount of gas, thus insuring the greatest amount of heat from the gas used, and burning every atom of gas that passes through the burner.

It cannot be used by simply attaching to an ordinary gas burner, but must be operated in connection with a blast of air supplied by a blower or air pump.

It will be observed, from the accompanying cut, that there are no

vent or air holes in the iron, as is the case with other gas irons, for by its method of heating, the flame is so pure that practically no vent is required. The burner being confined in a hollow chamber, all the heat created is used to heat the iron, allowing none to go to waste. It can be heated and ready for use in ten minutes, and can be regulated to any degree of heat desired, by simply turning off or on the gas and air, and can be kept at one steady heat as long as the supply of gas and air is maintained.

The iron can be kept very hot, or can be run at a low heat, to suit any kind of work or goods, and can in no way injure the most delicate fabrics. It is absolutely free from any smell of gas (one of the chief objections heretofore raised against gas irons), it makes no smoke or dust and is practically noiseless. It dispenses with all furnaces or stoves, and all the ashes, dirt and dust incident thereto, and greatly decreases the fire risk.

The rubber hose, which conveys the gas and air to the iron, might, at first sight, appear to be an objection, but experience has proven, beyond a doubt, that it is absolutely no objection, and is not of the slightest inconvenience to the operator. It is simple in its construction and not liable to get out of order..

It is obvious that more work can be done with one iron kept at a steady heat all the time, than with two or three that have to be changed every few minutes, and the time consumed by the operator going to and from the furnace or stove is thus saved.

The blower to supply the air blast is furnished at a small cost, and requires very little power to run it; the pipe fitting to connect these irons is of the simplest character and inexpensive. These irons are made in a large variety of shapes, sizes and weights to suit the different trades, and the makers are constantly adding new patterns as the trade requires them.

These irons are used by a number of houses in the clothing, cloak, shirt, shirt-waist, overall, underwear, umbrella, neckwear, felt and straw hat and other business, and there is yet to be heard of a single instance where they have not given complete satisfaction.

Stockwell & Ensor are the patentees and sole manufacturers of this iron, 614 N. Mount St., Baltimore, Md.

—Mechanical spinning and weaving are now immeasurably superior to what they were when handicrafts went down before them.

—The trade returns of the Congo Free State for 1897 show exports to the value of 17½ million francs, and imports 23½ million. Of the exports, 15 million francs represent the original produce of the Congo State.

The Revival of Hand Loom Weaving.

Paper read by Miss Clive Bayley before the Society of Arts, England.

Poetry and music thrive best, it is true, in the forest and in the moorland, where no coal smoke adds lurid glory to the sunset, nor sullies the heavenly purity of the air. Out on the lonely mountain sides the labored breath of steam, the clang of mighty engines, are unknown, and there is little wonder that the dwellers in those parts catch instead the footfall of phamtom deer, the passing of those "who are not," and of the many wondrous beings who people alike the imagination and the literature of primitive nations. It needs but little poetic instinct to revel in the silence of the forest. To catch the meaning of that silence, and to give it voice, is the inborn impulse of a child cradled by Nature, and taught in tongues which are too acute or too deep for ears dulled by a city's din. It is natural that the poetic fancy should intertwine itself with the occupations of home life, with the employments and crafts learnt at a mother's knee. Hence the runes of the Kalewala are rich in imagery connected with the trade of spinning and weaving, and when Wainominen, old and noble, is asked whence he got his songs, he says he gathered them from the forest, from the spring grasses, from the budding hedgerows, from the song of birds, and from his mother's wheel.

It requires a genius of quite another order to understand the throbbing vitality of a vast factory, pulsating with an energy which, though it is not human, is nevertheless the translation into very forcible prose of man's highest faculties—imagination, invention, creation. One must isolate oneself in that clanking wilderness of noise before one can realize that it is human intellect which lit the match and fused into active combination the latent forces of inert matter.

It requires only a moment's concentration of thought, most necessary in those who deem it possible that hand-weaving can ever supersede machine-weaving, to realize that it is precisely to these two inert masses, coal and iron, in steam and machinery, that we owe the phenomenal prosperity and ascendency of British trade. The history of the Victorian era is the history of expansive force and multiplied energy—of enterprise carried on the breath of steam, of energy manifolded by machine power; and it is only by this just appreciation of the scope of machine work—of its purpose and its significance—that we can in any degree grasp the situation suggested in the words, "the revival of hand-loom weaving." Much of the sentiment which hangs over hand-work versus machine-work is a cloud of incense, sweet but bewildering, which too often hides the shrine of truth, or dulls and enervates the understanding. I have heard a wish expressed that the followers of him who first lit a coal fire in London had been hanged, as he was, for polluting God's air; and for many years the cry of Devildust and his companions, as for the "rights of labor, the people goes for nothing with this machinery," was echoed by thousands who found their occupation gone. But so changed is the present aspect of affairs that the Yorkshire papers congratulate their machine hands that the present revival of spinning is not likely to interfere with their trade, nor come into competition with the machinery which has established so overwhelmingly an ascendency in our country. The rights of labor have shifted; the machinery is its bulwark, and not its bane.

To deal, however, exhaustively, or even comprehensively, in one short paper with all the different interests which merge themselves in the subject of hand-weaving and its revival, is difficult if not impossible. It needs but a moment's thought to realize how such a topic is fraught with difficulty; how it deals with burning questions of the hour; how politics, social problems, education, trade and commerce, colonial interests, and foreign affairs, are intimately affected by any such revival of an almost extinct industry,

should it pass the limits of a woman's fashion or a parish council-room.

So much æstheticism and even socialism has been talked about the question, that it is not easy to divest one's mind of a prejudice against, or a tendency to overestimate the movements, or to balance the reasons for and against such a revival with a calm and unbiassed commonsense.

THE THREE FATES.

The mere word revival leads us to remember that there was a time when hand-weaving was all in all, that its very supremacy gave birth to its competitor, and that its revival, if it lasts as we all trust it may, must be founded not on the death or decay of machine-weaving, but on a higher plane of superior workmanship, of quality as against quantity, of educated and delicate handicraft against precise but automatic skill.

We are told that the trade of our country is on the decline; that with an increasing population we have a diminished number of artisans and industrial work-men and women; that, owing partly to the foresight and educational system of Germany, Belgium, and Switzerland, the monopoly

of power-loom weaving is passing from us; that with us, as with Spain when she became the bullion dealer of the world, the industrial arts are dying strangled by that scorn of labor which is the precursor of industrial ruin. But prophets who prophesy wisely give always a loophole for the falsification of their words, and if we repent us of our indolence, our insolent neglect of that marvellous instrument of production which marks us off from the brute creation, we may yet turn the tide of ruin, and save the credit and industrial life of our country. It is chiefly to women that the nation looks for works humble in nature but significant and potent in results. The rights of women are established, and among them the one we chiefly appreciate is the right to work, and to those who desire to use that right, there is no difficulty in obtaining an opportunity to do so.

Now on the face of this question, it is self-evident that where quantity is concerned, the power-looms can turn out millions of yards of calico and of cheap goods, which it would take years for hand-looms to accomplish; and, therefore, no reasonable person would venture to suggest competition with this unskilled toil.

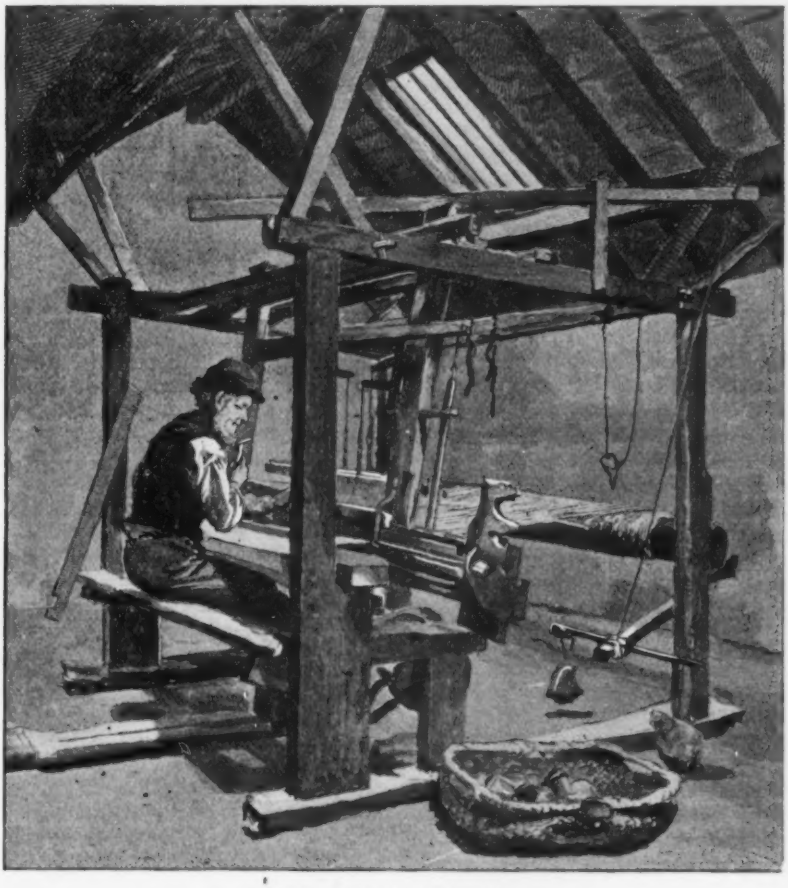
But there is no doubt that while machines are thus making us in one sense realize that time is money, and that every moment can be calculated at so much per yard, we have, as it were, displaced the balance of time, made so infinitely valuable in the factory and workshop, that we have there to put time limits, while in the cottage there is a glut of it, and in the homes of the educated classes there is too often so much time on hand that numerous devices have to be taken in order to kill it.

The women of England have had a surfeit of idleness, are weary of practising unending scales, exercises, and light music, on the ever-cheapening and what are really now cottage pianos; are sensible that rummage sales, fancy bazaars, and crazy patchwork are not the whole soul and business of life, and that missing word competitions, double acrostics, and even golf, bicycles, or croquet, are not sufficient to satisfy their activities and their restlessness.

Those who have turned what would otherwise have been their unused energies in the direction of charity organization, work on public bodies, such as school boards, as officials or school managers, and guardians, know how great is the same want of occupation among the poor. Machines have taken away a great proportion of the work which made cottage women busy. These latter spin not, they weave not, they make not, they mend not, and the bakers, soup kitchens, and schools take away the other occupations of baking, cooking, and looking after their children, which used to form so important a feature in their lives. There is, no doubt, somewhere or other, a plethora of washer-women and charwomen, but one always fails to find them, and the usual cry of women in their homes is the dullness and lack of interest, which necessitates amusement, either in the milder forms of village gossip, or, in some sad homes, of novel reading, drinking, and even gambling. Now it is just this waste of valuable time, of still more valuable human labor, energy, and intelligent activity, which places us at a manifest disadvantage with our competitors abroad. There is nothing more terrible than to go on a foot journey round some of what once were our most industrious villages, and ask, "What is your occupation?—how do you employ your time?" No; their mothers worked lace, their grandmothers spun, their predecessors in every generation did this or that work, but, in this generation, whatever strength or help can be gained from a population of industrious cottagers, is practically lost to the country, and why? because the machines have so increased the artificial value of time, that it is too valuable to use in unproductive arts, i. e., unproductive of money. The economy of labor is forgotten, the wasted energy is not taken into account, and the education of our last generation,

at all events, was that of know all, but do nothing. It is possible that a sense of the dignity of labor is now being awakened within us, but the loss of that sense has sent us back many generations in the path of industrial handicraft.

It is probably the weariness of doing nothing, and a reaction in our school system in favor of hand-work, which has brought us so far on the road toward the revival of what was once England's most noted industry, that the possibility of its revival is even mooted. Four or five years ago, such a possibility was regarded as the wildest chimera, and Langdale and Windermere fought the battle alone. Winterslow, Ramsbury, Haslemere, not to speak of Sandringham, have followed suit, and the Scotch and Irish hand industries are strong and recognized bodies, and gallant little Wales has rallied to the textile battle. Monmouth, Bristol, and Canterbury, Compton Greenfield, Satchville Heaton, and Little Gaddesden, have all their special interests, and scattered individual efforts all over the country testify to awakened interest.



HAND LOOM WEAVING.

The question is, if the revival spreads, how far may it be expected to extend? what are its limits? and what its possibilities? It is, perhaps, easier to speak of the actual revival and rapidly-increasing activity in the

silk trade—a revival not the less to be acknowledged, though both Bethnal-green and Spitalfields have been denuded of looms and workers. On the contrary, it is rather a virtue than a failing, that the recrudescence of the silk trade, in the hand branches, has drawn its workers away from the congested city streets into the purer air and cheaper regions of Suffolk and Essex. Ipswich, Braintree, Sudbury, and the villages around—Haveril, Glemsford, and others—are becoming centres of renewed activity, and if you want hand-weavers you will find it pretty well impossible to get them.

One of the causes of this partial recovery of hand-weaving is no doubt the wave of machine activity which is sweeping over Europe. Hitherto much of the hand-weaving in silk has been done in the mountains of Italy, in Switzerland, and the South of France. But what happened in the middle of this century in England has now taken place abroad. Capital has accumulated, and turned itself into machinery; peace has brought assurance to the capitalist, and quantity rather than quality is the goal at which he aims.

Give the possibility of obtaining good weavers in the silk trade, the proceeds of a hand factory are quite as great as those of a steam factory. The outlay in machinery in the latter instance is far greater than in the former. The time and labor of getting the machinery under way is for short lengths far more in a power-loom than in a hand-loom, and the work of intricate patterns is infinitely superior when placed in the hands of a practiced weaver than when entrusted to automatic machinery. Hand-loom firms rarely fail—power-loom firms are not nearly, I am told, so fortunate in this respect. But the great deficiency is workers, for after the first conquest of machinery, the product of hand-labor was discounted, and the exaggerated importance and value of time seemed to paralyze industry.

The superiority of work in the hand-looms will be a matter of positive proof and can be and is gradually becoming a subject of interest. The better the class of hand-workers we train, the greater will be this difference, and the more potent will be the industrial revival which reconquers what was supposed to be an abrogated kingdom.

Here is work which, if taken up as a profession and not as a pastime, may give work to thousands of our idle and discontented country women. Here, if peace is continued to us we may find a field of conquest which may enable us to disregard the diminution of machine labor, and the loss in the quantity produced, for the demand for a better class of article is on the increase, due as we have said partly to the rapid extension of machinery on the Continent, and partly to a revival of an artistic taste for that which is in itself the work of human rather than automatic skill.

There is, however, another extensive branch of this subject which deals with questions which may, perhaps, trend on debatable ground, and therefore, I should not like to urge it, though I may state it for what it is worth. A cry has been raised against prison labor, against industry in any form which, being State-aided, might interfere with trade. But since trade in our spinning and weaving centres refuses to be frightened by this mouse which nibbles only at chains of idleness, it is possible that there is no chance of opposition to the scheme. But the vast loss to our nation of many thousands of feeble-minded, feeble-bodied persons, who are dependent on the State or public for maintenance; of children in industrial homes, in State-aided asylums, not to speak of prisons, work-houses, and the whole mass of unorganized and unutilized energy—why should it not be turned to account, made useful to itself and to the country? Why should not the beneficent effect of manual education be extended to those who most need it, whose feeble mental capacity requires the development which such education gives?

Experiments are being made at this moment in a lunatic asylum, in a deaf

and dumb home, in an inebriate establishment, and in a work-house. Why should not such experiments be extended? Why should the extraordinary intelligence displayed by deaf mutes not be turned to account? Machine labor may never be ousted from the field by hand labor, but in the competition with foreign countries who have stolen a march upon us by education and technical instruction, let us in a life or death struggle use every instrument we possess, and strain every energy in defence of our industry and commerce. Hand-weapons are good and effective at close quarters, and we may wrest from them more than one field of enterprise, and win it for our own country-women and our own profit.

To be continued.

Valuation of Textile Manufacturing Property.

Market Value — Location — Taxes — Power—Buildings.

Paper read by Charles T. Main, Boston, Mass., before the American Society of Mechanical Engineers.

The engineer is called upon to place valuations upon manufacturing property for various purposes, as buying or selling, raising money upon or bonding a property, rental, taxes, insurance, adjustment of losses by fire or accident, and condemnation where private or corporate property is taken by the State or town for public improvements.

I shall confine my remarks to the valuation of textile manufacturing plants, and property usually connected therewith; but the same principles will hold good in the value of other properties, the application being made to suit the peculiar conditions of the business under consideration.

The court in Massachusetts has established that the true value of a property is its market value, and substantially that the market value is such a sum as one party who has the capital, and who desires to purchase, is willing to pay for a plant, the owner being willing, but not forced, to sell.

It would seem at the first glance that there should be but one value for a plant for any or all purposes, and that value should be its market value. This is the value which is most important of all, and upon which all other values largely depend.

Let us therefore consider, first, what is the "market value" of a plant, and what elements enter into the determination of such a value.

There are a great many who place more confidence in the off-hand estimate of the practical business man than in a careful estimate of value by an accountant or engineer; but, if the latter combines with his careful weighing of each element which enters into the whole plant a general business knowledge and a large quantity of common sense, the result will be nearer the truth than the off-hand value which has considered these elements in a general way only. It is not unlikely that the results might agree very closely, thus confirming the opinions and judgment of both.

By whichever method the value is determined, there must enter into it, either consciously or unconsciously, certain fundamental elements which determine its value.

The prices brought for small pieces of property, as house-lots, houses, and such properties as are being sold frequently, are a measure of value for comparison of adjacent and similar pieces of property; but the sale of a large plant is not an every-day occurrence, in fact it is a very rare occurrence; and the conditions which have made the sale necessary, and which surround the sale, and of the plant itself, are usually such that the prices realized cannot be used as comparative in determining the actual value of another somewhat similar plant surrounded by other conditions.

Into the market value of a plant enters the broad element of location, with its varying hours and price of labor; skill and abundance or scarcity

of operatives; cost of transportation of raw material, supplies, and finished product; cost of fuel or power; cost of construction and equipment; and rate of taxation. Also the narrower and more restricted element of the physical condition of the plant and its relative value to a new plant constructed upon modern principles, and constructed with all regard to the economical production of a finished product of the best quality of the goods manufactured.

The ultimate value of a plant is its capability of producing a profit.

The question of management is a personal one, and must not enter into the problem, except so far as to make sure that with good management the business would be successful. Although the past profits of a concern will have some influence in determining its value, that is not a measure of its value; because a purchaser might by different management reverse the profit or loss, or the changes, real or anticipated, in trade might do the same thing.

Textile manufacturing requires considerable power; the cost of labor is a large part of the value of the product; the labor must be skilled to produce a satisfactory product; and the cost of transportation of raw materials and finished products is considerable. All of these items require attention in estimating the value of a plant with reference to its location. If a new plant is to be built, all of these can be weighed approximately: but, if an existing plant is to be valued, the relative cost and effect of the fixed location with that of the more favored one must be determined as nearly as possible.

The effect upon the values of a property of excessive charges for carting and freight is to reduce its value, and the amount of reduction will vary somewhat, according to the return which a man or corporation is satisfied with. I should say that, taking into consideration the uncertainties of the future, one would be warranted in making an expenditure which promised a return of ten per cent. on his investment. That is, if a person is considering the purchase of a property, and finds that the extra cost of carting and freight would be $1,000 more a year at the fixed location of the mill than at many other locations which might be chosen for a new mill, with all other conditions equally as good, that he would say that he could afford to pay $10,000 more for a mill at the more favored location than for the one under consideration; or if the mill is to be purchased with this incumbrance upon it, that its value would be $10,000 less than if situated at the more favored location.

The situation is equivalent to the mill having a mortgage upon it which requires the payment of $1,000 a year for all time, and the net value of the property to a purchaser is its full value less the amount equivalent to the $1,000 tax.

There are certain localities which have become centres for certain classes of work, where skilled workmen in their particular trades are in abundance, and which may have other distinct advantages. There may be a choice between several centres devoted to the same class of work, the balance of the sum of all the advantages being in favor of one particular place.

The rate of taxation and the method of valuation for taxes may afford a decided advantage to some particular location. This is a part of the fixed charges of the plant which is always visible, and which goes on whether the business goes on or stops.

In the same way as for greater cost for transportation, the greater cost for taxes would warrant an expenditure of an amount which would return an income of about 10 per cent., and would therefore decrease the value to a prospective purchaser by that amount.

A more remote item, and one which cannot be figured in dollars and cents, is the general character of the municipal government and its attitude towards industrial enterprises.

The cost of construction in one place may be less than in another, and the

purchaser having his choice of locations should consider the effect of this item. Clearly, if all other things are equal, one could not afford to pay any extra charge for construction and equipment of the mill more than the cost at the most favored location, and the value of an established plant must be diminished by an amount which represents the difference.

The cost of power, which is another one of the fixed and general expenses of a mill, has always been a problem in the determination of a site. Cheap fuel is to be desired, especially where large quantities of steam are required for other purposes than power.

It very often happens that a mill whose value is under consideration is driven partially by water power—very rarely is it driven wholly by water power—and the approximate estimate of the value of the power must be made.

The essential points which must be considered, as to whether an undeveloped power can be developed and used to a greater profit than any particular business or the general run of business could be conducted elsewhere with a different source of power, are as follows: Quantity of water, uniformity of flow, head, conditions affecting the cost of construction, freight charges, use of exhaust steam, need of water for other purposes than power, and more uniformity of speed attainable from steam power than from water power. The determination of the flow is not always easy. The flow can be measured at intervals, but a continuous record is needed to get at the flow with much exactness. In many places no records are kept which are of any value, and the only recourse is to estimate the flow from the rainfall and character of the water shed, and by comparison with existing records of similar streams.

The power which has the most value is one which has a flow during a dry year which is nearly constant, or which can be made so by storage basins, and which requires no augmentation from other sources. Its value can be determined by comparison with the cost of uniform power produced in a fairly economical manner, at any place or places equally convenient to the place at which the water power is located, for the transaction of the business under consideration.

The value of an undeveloped constant water power is such a sum as when put at a proper rate of interest, say 10 per cent., will pay the difference in cost between steam and water power, all items of cost being considered.

In determining valuation, comparison must be made with the cost of a new and model plant, and between the cost of operating the old and the new plants in so far as the organization of the old plant is detrimental to economical running, when such poor organization cannot be rectified. When it can be changed to a proper organization, the cost of making this change must be deducted from its value, if such defects did not exist.

The first cost to be used in comparison, then, is the cost to-day of a plant which will produce equal results in quantity and quality as the one under consideration.

The value of buildings should be determined by comparison with the cost to-day of a new structure with all the modern and improved ideas with regard to style of construction, large amount of window area, arrangement and size of rooms and buildings with reference to convenience and cost of operation and space occupied.

A mill or building with low stories and small windows, and with a large number of small rooms, even if new, would not have the value of a modern mill building, with higher stories, large percentage of window area, and large, clear floor areas.

To get the selling value of a building the cost of a new and modern building should be depreciated:

First. For the difference in style of construction.

Second. For lack of light which makes it necessary to produce more artificial light.

Third. For the amount of floor

space which is unavailable, due to the subdivision of the space or to the style of construction.

Fourth. For the increased cost of operation due to inconvenience of arrangement of rooms or buildings.

Fifth. For the increase in cost of insurance over that on a modern mill.

Besides the actual cost of producing artificial light where it is dark, which can be estimated, there is a loss due to a little less production, also because the production is not fully equal in quality to that made where there is plenty of daylight.

After determining the value of the buildings, if they were new, there remains to be applied the depreciation from age. This to a certain extent must be an arbitrary quantity, but based upon the average life of buildings of the character of those under consideration. It would seem that one per cent. a year is little enough for brick buildings substantially built, credit being given for any extraordinary repairs, renewals, or additions.

We must not lose sight of the fact that, although a building may not at the end of 100 years be completely worn out, the character of the business may so change that the buildings are not adapted to it, and that they will be rebuilt, as we have seen the older buildings replaced with new ones of different style.

The depreciation of wooden buildings is greater than brick, depending upon the purpose for which they are used. Buildings which are kept dry, and not subjected to much wear and tear, would, if well built, last a hundred years; while wooden dyehouses, subjected to steam and wet, will not last over, say, twenty-five years.

The length of life depends largely upon the care that has been given to repairs. If the roof is kept in good condition and wood-work well painted, the depreciation is less than if no care is taken.

The first cost of a modern mill is the measure of value for the building under consideration, and not the first cost of this particular building; for the building may have been built in a very expensive way, highly ornamental, or in a location which caused very expensive foundations. None of these extra costs add anything to the productive value of the plant, and therefore must be sunk out of sight.

In some cases the town or city grows around a site and the value of all surrounding land is increased. The value of the mill site, however, has not increased for the purpose to which it is put, and it is of no more value for manufacturing purposes than a site in the suburbs, if other things are equal, instead of being in the congested portion of the city. To a purchaser who wanted the plant to run, its value would be no greater than if it were located where land was cheaper and other things equal; but if the whole property were so run down that a purchaser intended to dismantle the concern and get what he could out of it, the land might then be figured at greater value; but this sort of valuation is beyond the scope and purpose of this paper.

For water-wheels, the average life of the wheel is probably about twenty-five years, while the casing might be allowed to outlive two wheels. Iron or steel penstocks, if taken care of, should last probably 100 years, but wooden feeders underground will not last fifty years. Wooden flumes, gates, and racks which are exposed to the weather will last about twenty years. Some wooden dams have lasted a great many years, but they are apt to get washed away in freshets. Stone dams, if properly designed and well built, will last for hundreds of years.

The market value of the wheels would depend somewhat upon their efficiency, independent of their physical conditions; for it might pay to replace them, if water is expensive, by wheels of higher efficiency. The vertical wheels with bevel gears will not produce as much net horse power per cubic foot of water as the horizontal wheels; and with the horizontal wheels the extra expense and danger of breakage of gears is avoided.

The value of the steam-power plant

will depend upon its character and its condition; and its condition depends very largely upon the service which it has rendered.

With good water and good care, running about twelve hours a day, the life of a boiler should be about twenty years, or the depreciation five per cent. a year. Slow-speed engines, running ten hours a day, can be estimated as having a life of about twenty-five years, or a depreciation of four per cent. a year. High-speed engines are much shorter lived, and will not average over fifteen years, or a depreciation of about seven per cent. a year; and often times it is greater when run ten hours a day. The depreciation when run twenty to twenty-four hours a day is correspondingly greater. Boiler settings and piping should be included with the boilers, and engine foundations and piping with the engines.

The life of economizers varies with the initial temperature of the entering water from about ten years up to forty.

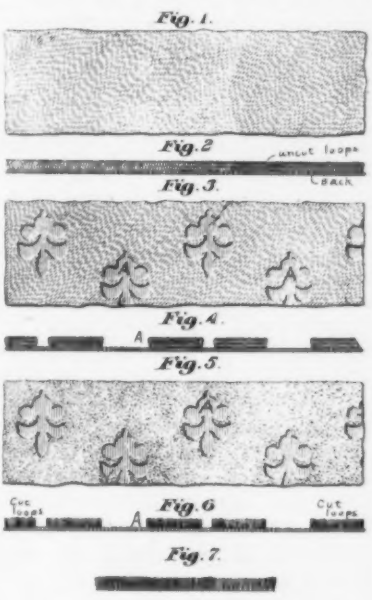
If steam is to be used for power exclusively, the compound or triple expansion engines of proper designs are the most economical, and for mill work the compound is more common of the two.

(To be continued.)

Plush Fabric.

We present to our readers, herewith, illustrations of a newly invented plush or pile fabric, the face of which may present at intervals, according to the design it is desired to produce, uncut and incut portions. A piece of loop pile fabric woven in any usual manner is first taken and subjected to the action of size, which thoroughly permeates the pile and preferably also the back of the fabric, and when the size becomes dry the loops are stiffened, so that they will normally stand erect from the backing, and the loops are held securely in the backing by the size, so that when the standing sized and stiffened loops are being cut or sheared to make the plush the loops cannot be accidentally torn or pulled out to the detriment of the fabric. Then to produce a plush showing at its face a design or figure has to be only a portion of the sized, dried, and uncut pile-loops depressed by the action of a suitable pattern-plate or die, and while so depressed the stiffened standing pile is cut and thereafter the size washed out or removed from the fabric, and, freed from size, the previously-depressed uncut pile-loops are raised and stand in the surrounding field of cut pile to present the desired design. The loops are cut while stiffened by the dried size yet on them, and thereafter the size will be washed out, leaving the pile soft, elastic, and pliable.

Figure 1 shows, in face view, a portion of a piece of pile fabric suitable



for plush, the right-hand end of the pile face being represented as darker, it being supposed that that end has been sized. Fig. 2 is an edge view of Fig. 1. Fig. 3 shows a face view of a portion of the pile face of the fabric after the same has been sized and some of the uncut pile has been depressed. Fig. 4 is a central longitudinal section of Fig. 3. Fig. 5 is a

view like that represented in Fig. 3, but with the standing pile cut. Fig. 6 is a central longitudinal section of Fig. 5, and Fig. 7 an edge view showing part of the fabric Fig. 5 with the size removed to let the uncut pile rise in the field of the cut pile.

To make a plush fabric a pile fabric is woven, it presenting a back with a series of standing uncut loops, the loops being composed of any usual or suitable material, such as commonly used in the manufacture of mohair, wool, or other plush. This pile fabric is then sized heavily, preferably on the face and back, the size permeating thoroughly the pile and back, so that when dried the pile and back are so stiffened that the pile may be cut and the pile-loops not be pulled out of the backing during the cutting operation. Then the sized and dried pile fabric is taken and its pile-face subjected to the action of a suitable embossing-pattern applied to the surface of a suitable roll or die having projecting surfaces corresponding in shape with the design to be produced and press the same firmly on the sized fabric, thus depressing or crushing down in figure or design, as at "A" a portion of the sized pile-loops, leaving them depressed or crushed down below the level of the standing pile-loops, and thereafter the dried standing pile-loops may be cut by the action of a suitable rotary or other cutting-knife to leave cut loops for the face of the plush. This pattern or roll may be more or less heated, as desired. After this the size may be washed from the fabric and the depressed or crushed-down uncut pile-loops may then be raised, so that they will stand up, as in Fig. 7, and form part of the face of the fabric and show the figure or design.

The plush fabric containing patterns or figures as described will present a series of uncut pile-loops in a field of cut pile-loops, and the proportion of the uncut loops to the cut loops may vary accordingly to taste and the design to be produced.

The sizing of the pile-loops at the face is of great advantage, as it enables the embossing-pattern to act on a defined portion of the face of the fabric and form a clean-cut embossed figure, and the sizing of the back is also of material advantage, as the size cements the pile-loops and back together, so that there is no danger of pulling out the loops during the cutting operation.

Cotton Market.

The price of middling uplands at present writing is 6 3/8 cents against 6 7/16 cents per pound last month. Very little has been done in cotton the last month. Some effect upon speculative prices was occasioned by the failure of Mr. Leiter in the wheat market. There is no demand for the staple from spinners, either at home or abroad. The demand for goods in England and upon the Continent appears to have been lost. The chief factor that now dominates the market is the yield of the 1898 crop, which probably will loom up about as large as the last one. The season is sure to end with a large surplus. At present writing, everthing looks favorable for the growing crop. Advices from Liverpool represent that spinners there have bought only sufficient cotton to meet their immediate requirements, and the sales have fallen much below the rate of consumption; but, owing to previous extensive purchases, the surplus stocks at the mills are still larger than for several years past, at this date. A sudden termination of the Spanish-American war, in the estimation of close observers of the cotton market, would probably lead to sharp fluctuations in prices, both up and down.

We quote from a recent circular of a firm representing an Alexandrian house, to the effect that the Egyptian cotton crop is in a rather backward state, but, in general, the plants are in a normal condition and progressing favorably. Their condition, taken altogether, is about the same as at this time last year.

"Worms, in small quantities, have made their appearance in several localities, but have been distributed

owing to great heat, and have occasioned no damage up to the present. Water is far from being plentiful, but, thanks to the system of rotation, irrigation has been carried on regularly. In upper Egypt and Fayoum, the reports as to the state of the plants are satisfactory, although somewhat late. Water is distributed there rather more easily than in Lower Egypt."

The Wool Market.

The market continues to be very quiet along the lines of wools, with the possible exception of those that are sought for filling government contracts. But, while these contracts keep a few of the mills busily engaged, and in some instances over time, their effect upon the industry in general is very slight; yet, there is a strong feeling that business will show a decided improvement before many months have elapsed. The raw material occupies a strong statistical position, notwithstanding some few weak spots are discovered each week. Purchasing of wool in the West has come pretty nearly to an end, and buyers are returning homeward. Prices for the raw material in the wool growing region are held firmly by growers and speculators. More wool has been consigned this season than heretofore. The quotations for Ohio XX and above are 29 to 30 cents, while XXX commands 32 to 33 cents. Australian Port Philip combings, 60's to 64's, sell on the scoured basis of 67 to 68 cents, and 70's on the basis of 70 to 72 cents. There has been a rumor of late, which has been confirmed, of the placing of contracts for fine worsted yarn, amounting in the aggregate to 800,000 pounds. This quantity has been divided as follows: 400,000 pounds to Howland Croft Sons & Co.; 300,000 pounds to the Arlington Mills; and 100,000 pounds to the Centredale Mills. These contracts have been placed at prices which could not be accepted only for yarns made from ante-tariff figures. The filling of the contracts will have the effect of reducing ante-tariff wool. What remains of these wools, so far as the holdings in dealer's hands is concerned, is in the possession of three or four houses of great financial strength. To show the relative price of Australian wool for the last four years, we note in one of our English circulars that Victoria wools sold in London, June 8, 1895, at 8½ d. to 10 d; at the same time in 1896, at 11 d. to 12 d.; 1897, at 9½ to 10½ d.; and 1898, 10½ to 12 d. The woolen industry in England, according to our latest reports, shows no real improvement, but manufacturerers have been fairly well employed, even if on a somewhat unremunerative basis, and the easy level of values for the raw article has been a help, though not sufficient to encourage a policy of laying in extra stocks. In France, the trade is reported as dull.

—In sash ribbon novelties abroad the plain taffeta weave is shown, with a lace borded in applique on the edges with the interstices filled in with a printed black bobbin twist; neck scarfs are made to correspond.

—Some classes of goods are worn all the year round in the English climate, which has not, as a rule, the extremes of heat and cold possessed by other countries in northern latitudes.

—A Scotch buyer always insists that he wants a cloth to "fill the hand," which is a terse but significant way of informing one that thin goods are of no use to him; whilst an Irish buyer is always hungry for plenty of weight, whatever the quality may be.

—Samuel Crompton, the inventor of the mule, had no idea of eliminating snarls when he invented ratch and gain in the mule. These are the two main principles of spinning yarn on the mule over that of the throstle.

—In all the textile arts, except point and pillow lace-making and tapestry weaving, the handworker plies his craft under exactly the same limitations as the machine, but with a hundred chances of making bad work against absolute accuracy on its part.

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COTTON DEPARTMENT.

American Cotton Spinning Machinery.

CHARLES CLIFTON HEDRICK.

ARTICLE IV.

(Copyright.)

One of the characteristics of good yarn is evenness. This is dependant upon the successful manipulation of the cotton in all of the processes which it undergoes. Reference has been made, in a previous article, to the doubling of the laps upon the aprons of the intermediate and finisher pickers. This is of great importance in the process of evening, but the first stage in the formation of the lap, which is upon the breaker picker, may be considered as the starting point for this operation. While it is true that a carefully-made lap may be entirely spoiled by the careless handling of the machines, before it is spun into yarn, as is often the case, the sooner we commence the operation of evening the mass of cotton the better final result will be obtained.

It is a well known fact that when the hopper of the automatic feeder is quite full, the lap is apt to be heavy and, as the cotton is allowed to run low in the hopper, the lap will be found to be correspondingly light. When an attendant is required to take care of quite a number of feeders, the laps from the breaker picker vary considerably in weight, owing to his inability to keep them filled to near enough an uniform height. In order that the automatic feeder shall deliver the same amount of cotton to the opener, at all times, many of them are

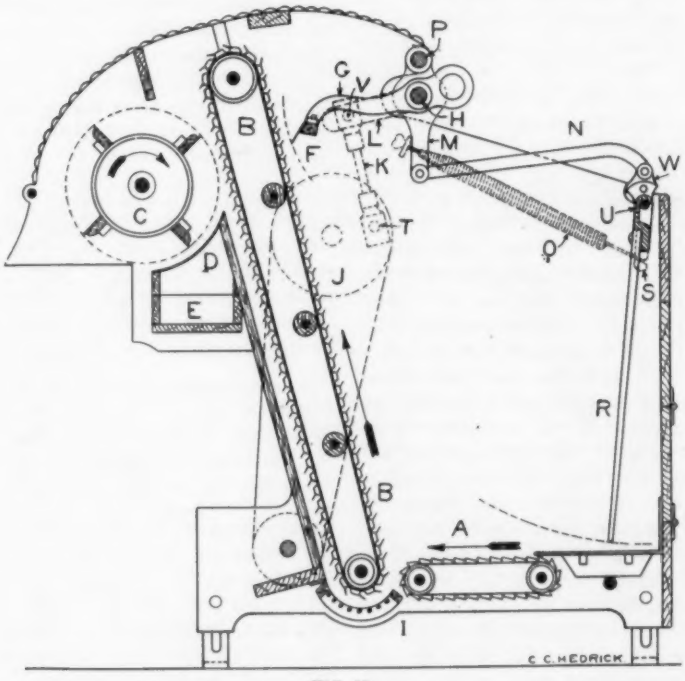


FIG. 18.

provided with eveners of some description.

Figure 18 shows a section of an automactic feeder which, besides having an evener, possesses some points which are quite distinct from all other feeders. This feeder consists of a bottom apron, "A" an elevating apron "B," supported by carrier rolls and a doffer, "C." Beneath the doffer is a

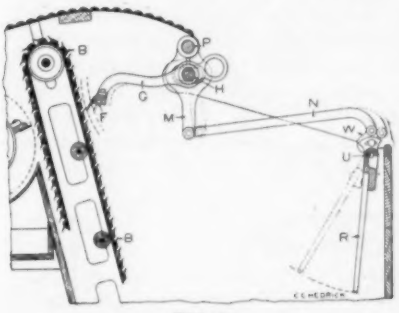


FIG. 19.

screen, "D," and a dust draw or box, "E," while beneath the elevating apron is also a screen, "I," all of which parts are common to most feeders. Instead, however, of having a spike roll to remove the surplus bunches of cotton, from the elevating apron, this feeder is provided with a comb "F," which is carried by several arms, "G." These arms are fastened to the comb shaft "H," the latter being hung from the shaft "P," by swing stands, "M." The oscillations of the comb are obtained from a pulley, "J," in one arm of which is fastened a stud, "T." This stud is connected by a pitman, "K," to a similar stud, "V," in the arm "L," which is fastened to the comb shaft. Figure 19 shows an enlarged section of a part of the feeder and Figure 20 shows an elevation of the same.

The device for regulating the feed is constructed in the following manner: In the back part of the hopper is a rack, "R," constructed similarly to a rake with very long tines, which is suspended from each side of the hopper by studs "U," which form a centre about which it swings. Projecting from the top of the rack are stands "W," which are connected to the comb shaft swing stands by arms, "N." By this arrangement, it will be seen that any swinging motion of the rack will be communicated to the comb by the connections described. On the outside of the hopper are springs, "O," which are connected to arms, "S," which are fastened to the outside ends of the studs, "U," from which the rack swings. The pull of the springs is such as to draw the rack towards the elevating apron. When the hopper is full, or nearly so, the cotton keeps the rack nearly in a vertical position, but, as the cotton gets low in the hopper, the springs draw the rack forward, towards the elevating apron, while the comb is drawn away slightly from it. By thus increasing the distance between the comb and apron, (which is shown by the dotted lines in Figure 19) more cotton is allowed to pass forward to the opener, tending to keep the feed the same at all times.

Another style of automatic feeder, provided with an evener, is shown in connection with an opener in Figure

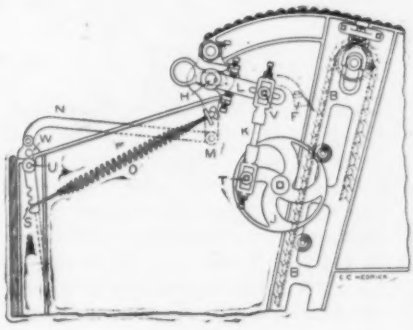


FIG. 20.

21. With this feeder the supply of cotton delivered to the opener is regulated by the speed of the elevating apron in the feeder which in turn is governed by the thickness of the sheet of cotton, passing between the evener rolls. As the quantity of cotton in the hopper grows less, the amount fed to the opener must be lighter, thus the speed of the elevating apron and the feed rolls, on the opener, are corres-

pondingly increased, so that the amount of cotton delivered to the beater shall be the same at all times. The elevating apron, "A," is driven by frictional contact with the top apron roll, "B." On the end of this roll is a wormgear, "C," which is in contact with the worm, "D," upon the end of the cone, "E." This cone is driven from the drum, "F," by the belt, "G," which passes around the carrier roll, "H," and binder cone, "J." An end elevation of the cone is shown at the right in Figure 21. On the end of the beater shaft, and shown by dotted lines, is a pulley, "K," which drives the drum, "F," by means of the belt, "L," pulley, "M," and gears, "N" and "O," the last being upon the end of the drum shaft. On the top apron roll is a gear, "P," which drives a similar gear, "R," and on the hub of the latter is a sprocket wheel, or gear, "S," which drives, by means of the sprocket chain, "T," the wheel, "W." The feed rolls, "A^1," are driven from the hub of this sprocket by the gears, "C^1" and "D^1," while the evener rolls, "B^1" and "B^2," are driven by the gears, "C^2" and "E^1." It will be seen, by this arrangement, that any change in the speed of the elevating apron directly effects the speed of the evener and feed rolls.

Figure 22 is a section showing the arrangement of the evener rolls and feed rolls and Figure 23 is a view of the evener case showing the rolls, levers and parts connected.

The cotton passes along on the feed apron, "F^1," under the press roll, "G^1," and is drawn between the bottom evener rolls, "B^1," and the top evener roll, "B^2," then between the feed rolls "A^1." The bottom evener rolls, which are about two inches in diameter, are made solid, while the top roll, which is driven from one of the bottom ones by gears "H^2" and "H^3," is about three inches in diameter and is made up of a series of eight short rolls each about five inches long. These short rolls, which are hollow, are connected as shown in Figure 24. In the face of the rolls and near each end is a hole through which is driven a steel pin. These pins, "A^2," are connected by dogs, or universal joints, "A^3." In this manner rotary motion is communicated, from one to another, while a vertical movement of one, or more, may take place, subject to the varying thickness of the cotton passing between them and the bottom rolls. The whole arrangement forms a very neat flexible roll.

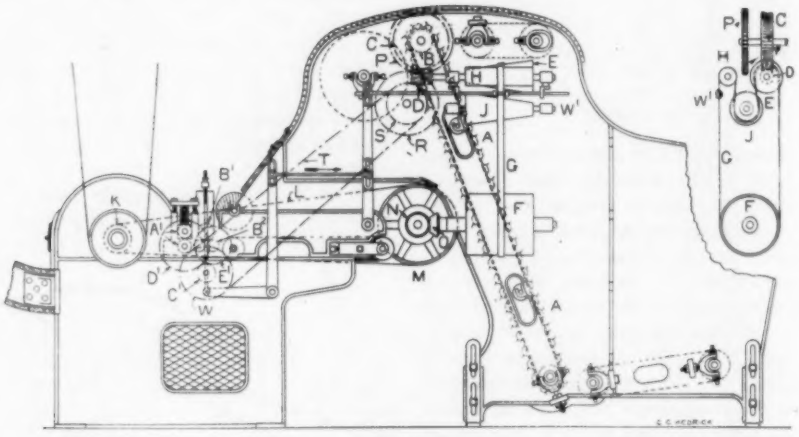


FIG. 21.

On the top of each of the short rolls (Figure 23) rests one end of a small saddle, "G^2." These saddles are connected by other saddles, "H^1," while a main saddle, "J^1," forms a connection between all of them.

On the top of the evener case is the evener lever, "K¹," which is connected to the main saddle by the stem, "L¹." The fulcrum of the lever is at "M¹" and the long end is connected to a rod, "N¹."

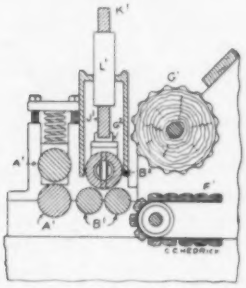


FIG. 22.

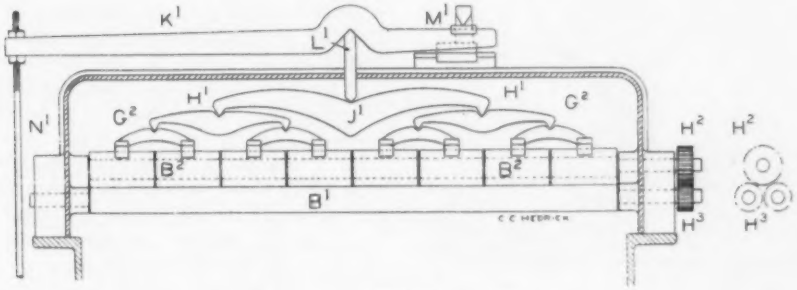


FIG. 23.

Figure 25 is a side elevation showing the connections between the evener lever and the cone belt guide. It will be seen that the lower end of the rod, "N¹," is connected to a bell crank lever "O¹," which turns on a stud, "P¹." A horizontal rod, "R¹," connects the vertical arm of this lever with the lever,

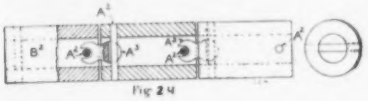


Fig 24

"S¹." At the lower end of the latter is a stud, "T¹," which forms a fulcrum, about which the lever turns. At the upper end of it is connected the cone belt guide, "W¹." When the evener roll is raised, by reason of an unusual thickness of cotton going through, the evener lever also raises and the connections, just described, move in the direction shown by arrows. This moves the cone belt towards the large end of the driven cone, "E" (Figure 21) and a slower movement of the elevating apron takes place, delivering less cotton to the opener, while a light feed will cause a reverse movement in the direction of the cone belt towards the small end of the driven cone, thus increasing the speed of the elevating apron. This style of evener, for regulating the feed of cotton, when in a loose form, or "raw stock," as it is called, is one of the most perfect in use.

—A Brussels inventor proposes to produce a colored woven fabric in the following manner: The warp threads are placed on the loop beam, and are well separated from one another. They are then passed through a trough containing a preparing liquor; next they are passed over a revolving metal or wood printing bowl; then over a drying chest, and finally to the loom to be woven. The design on the printing bowl is formed of a larger number of small blocks of dry coloring matter, the damp warp threads as they pass over them taking up as much color as is required.

—Give the machinery the same quality of material as the handworker, and the product will be better than the latter can produce.

—A very important matter is the testing of the strength of yarns. For this purpose various forms of machines have been devised.

Principles of Cotton Spinning.

BY ROBERT CUNLEFFE.

This process following that of opening and scutching is the carding. The carding of cotton is considered to be the most important operation in the whole process of cotton spinning. Upon the proper manipulation of this machine depends in a very great measure whether the yarn to be produced will be dirty, rough and neppy, or otherwise. There are different kinds of carding engines, worked and set in different ways according to the different kinds of cotton to be operated on, and the quality and counts of yarn to

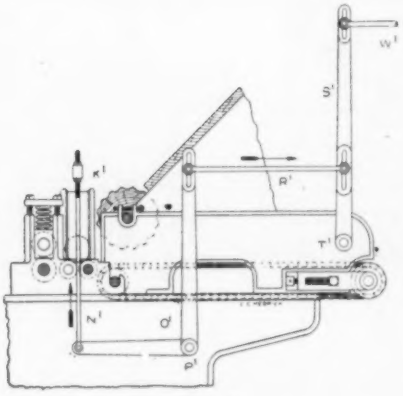


FIG. 25.
American Cotton Spinning Machinery.
Page 57.

be spun from it. There is the roller and clearer card which is used chiefly in the coarse spinning mills, or in those mills using the lower grades of cotton. This card was first used for carding wool, and if its principle of working is considered it is well adapted for that kind of work, where, as in woolen yarn, a great amount of the fibre is seen outside the thread, making, as we technically call it, oozy yarn. In the low grades of cotton, where quality is very seldom taken into account, it is a very good machine for getting through a large quantity of stock. But even this machine is going out of date and the revolving flat card seems to be pushing all others one side. This latter card is used in most, or, we may say, all modern mills, especially where the better grades of cotton are used, and the finest yarn spun.

The Wellman flat card was considered a few years ago to be the best card for the longest and finest cottons. It has stationary flats, and an arm is caused to work from back to front lifting up a flat, and whilst thus lifted a stripper is moved under it, and with one stroke the flat is cleared, and it then returns to its place. The arm is then moved to the next flat but one, and the same operation goes on as before. But we can easily see that in the stripping of the two flat cards there is very much in favor of the revolving card. The objection to the Wellman or stationary flat card being that practically a space, the width of the flat, is bare on the cylinder continually, for no sooner is one stripped and let down in its place than another is lifted up. Thus there is a bare space constantly on the cylinder. Not only is this the case, but the dust and dirt flying about the card is drawn in by the draft caused by the the great speed of the cylinder, and besides the stripping of the flat itself is objectionable. The stripper passes under the flat, and with only one stroke it is expected the flat will be stripped, but often the strip is simply rolled in a lump, and when the flat drops in its place, this rolled-up strip passes on with the cotton, producing neppy yarn; whereas in the revolving flat card, when the flat has travelled to the front of the card, it is turned over and a stripper is so placed that the flat gets two or three strokes with the stripper, then passes on a little farther and is then brushed out; these operations taking place at the outside of the card and all the dirt and strips are prevented coming in contact with the cotton on the cylinder. A much cleaner sliver is thus produced.

In addition to the two machines just referred to, there is also the Union card. This is a combination of the roller and clearer card and the flat card. A few years ago it was thought that to attempt to pass cotton direct from the

lickerin to the flats would result in filling the sliver with neps, and a roller and clearer, and sometimes two rollers and two clearers, were placed next to the lickerin, and then the front of the cylinder covered with flats. But this card is now very seldom used, unless specially ordered, as is sometimes done on the Continent of Europe.

But whatever kind of card is used, the principle underlying all, is the same. And perhaps the question may be asked, what is that principle? Or to put it another way, what are the objects aimed at in the carding of cotton? And after having satisfied ourselves as to the objects to be attained, then to point out the best methods of attaining them. If the lap taken from the scutcher and placed behind the card, be examined, it will be found that the fibres are matted together and lying in all directions. and the lighter impurities, such as nep, short immature fibres, and broken seed, are still adhering to it. It is absolutely essential to the production of a good and clean yarn that these impurities be effectually removed. The lap itself also requires to be very considerably reduced in bulk, from about, say, 10 or 12 oz., per yard, to about 48 or 50 grains per yard.

We may briefly summerize the objects of carding as, first to draw out the heavy sheet of cotton forming the lap, into a thin fleece, and form a sliver for the next process; second, to disentangle, and to some extent lay parallel, the confused mass of fibres forming the lap; third, to remove all impurities, either natural or foreign, which may have been left in by the preceding process; and fourth to remove all immature, short, broken or nepped fibres, the retention of which would materially depreciate the quality of the yarn. In our next we will proceed to point out the best means to secure these objects.

(To be continued.)

--When yarn has to be dyed, bleached, and probably shipped abroad, it is usually made into as loose a condition as possible.

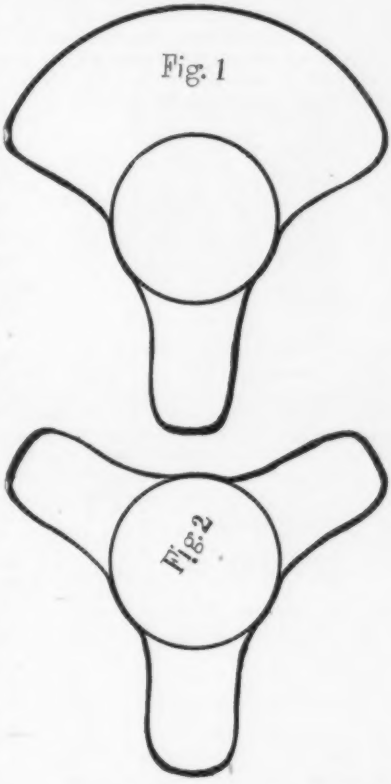
Huckaback Cloth.

Editor Textile World:

Will you please send me the draft and strapping plan for a roller loom, by which the enclosed sample of fabric can be woven.

Penn. T. S.

The sample sent us by our correspondent is from a piece of linen huckaback cloth, woven on a loom with



four cams, two each like those shown in Figs. 1 and 2, and four harnesses, two for the plain and two for the figured weave. The yarn must be drawn in the harnesses as follows: 1st, 2d, 3d, 2d, 3d, 2d, 1st, 4th, 1st, 4th, and repeat to the full width of the cloth. (See figures 3 and 4).

The motion is as follows, which may be understood by referring to the accompanying drawing. An ordinary harness roller marked "H" with the set collars marked "F" upon it, one at each end of the roller. This roller is held in the end of the bracket marked "E" and to the set collars of this roller the two plain harnesses are

attached. The plain harnesses will be at the front. For the supporting of the 3d and 4th harnesses, a rod marked "D" is used, each end of which is held in the bracket "E," which is simply an extension of "E'." The rod "D" is fixed in "E" by set screws.

The bracket, with the extended parts "E" and "E'" is held in the usual manner in the arch of the loom.

In the usual plain cam movement, when one harness is depressed another one is lifted. It is desirous in this case, having brought the number of harnesses down to four, and the third and fourth harnesses being depressed for three successive picks, at intervals of six picks, that the third and fourth harnesses be made to work

Fig. 3.

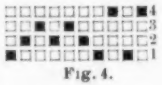


Fig. 4.

independently, while the front two harnesses are weaving plain. To obtain this movement, four spiral springs are utilized. Two are placed on each end of the rod "D" as shown in Fig. 5. The two springs that are

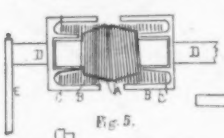
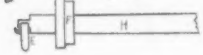


Fig. 5.



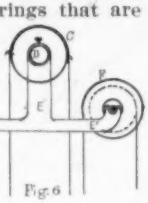


Fig. 6

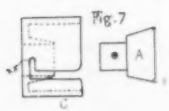


Fig. 7

placed together are to be in opposite directions so that the harnesses marked "G" can be strung up as shown in Fig. 6. Fig. 5 gives a sectional view of springs and attachments as they are placed on the rod "D." "A" is a stud that is fixed on the rod "D" by a set screw sunk in the stud, to prevent contact with the spring. "B" is a spiral spring, one end of which is held in a depression made in the stud "A" shown at "X." The other end of the spring is made in form of a hook to which the harness strap is attached. This fits in the slot of the cap "C," noted at "XX" The cap "C" fits over the major part of the spring; and on the cap the harness strap is placed. The cap is prevented from sliding back out of position, by a small collar set, screwed on the rod "D."

Figure 7 shows cap and stud apart. The cams are made for 6 picks to the round. These should be placed on an auxiliary shaft driven by gear from the pick cam shaft. A 20-tooth gear should be on the pick cam shaft, and a 60-tooth gear on the auxiliary shaft. The harnesses are to be connected to the treddles in the ordinary manner.

—Thos. Cook and Son, passenger agent to the Royal British Commission, have arranged a scheme whereby workmen and others will be enabled to visit the forthcoming exhibition by means of weekly payments. Thus, 50 payments of 1s. a week will entitle the subscriber to the journey to Paris and back, hotel accommodation for three days, two days' admission to the exhibition, an excursion to Versailles, payment of all necessary fees and also to the services of Messrs. Cook's interpreter.

—Practical experience has shown that the most suitable time for the cotton to take the dye is immediately on its leaving the carding engine, when it is freed from all impurities, and has not had any twist put in.

—For the production of the finer qualities of cotton tissues of all kinds it is important that the yarns which are used shall be of uniform quality and free from curls, knots, and uneven places.

—The term "snarls" in mule spinning sometimes are called "snicks"; both words or terms however mean the same thing, though no doubt the more correct word is snarls. Snarls are formed from a variety of causes, viz—(1) winding too slack; (2) faller unlocking too soon; (3) carriage out of square; (4) nosing motion not working right; (5) easing motion delivering too much; (6) too high counts being spun for the quality of cotton; and (7) rollers commencing to deliver before carriage has got into action.

WOOLEN DEPARTMENT.

Science and Practice of the Construction of Woven Textures.

FRED BRADBURY.

(Continued from May.)

A careful survey of the results just obtained in conjunction with the construction of the actual fabric, considered simultaneously, affords a further example which it is advisable to repeat here, to the effect that any variation, such as an increase in the normal setting of a fabric, in either direction, warp or weft, assuming that the weave and other fundamental data of textural structure remain constant, involves a decrease in the opposite set of threads. The converse of this is also true though not necessarily, in either case, in a direct ratio, but subject to such modifications as weave structure, relative bending powers, etc., as heretofore demonstrated. The enumeration of these several points to a designer or manufacturer, in addition to worked out examples, comprising both theory and practice, should contribute largely in extending his field of thought and enlarging his vision of the work he is called to operate upon.

All the foregoing problems are factors which must be previously anticipated and approached with an intelligent mind and conception of the work to be necessarily done, otherwise the final result, if satisfactory, can only be determined by repeated experiment, frequent irritation and consequently increased expenditure.

If now we confine our research conjointly with practice to the structure of a union fabric in which the warp threads are produced from Botany wool and the weft from cotton, we shall be further able to demonstrate the truth of the above assertion. This fabric was produced more in the interest of experiment and for the satisfaction of a customer than as a regular make, since unions in which the warp is of the better quality usually involve a relatively greater cost than when the warp is cotton.

The following are the particulars of make of the sample of union cloth it is proposed to consider.

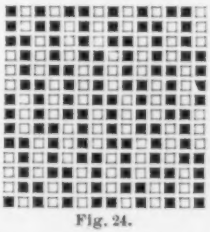


Fig. 24.

Warp 2/32s Botany—Worsted counts—Diameter $\sqrt{(560 \times 16)} - 10\% = 1/85$ inch.

Weft 2/30s Cotton—Diameter $\sqrt{(840 \times 15)} - 8\% = 1/104$ inch.

Threads per inch of warp in loom = 72.

Threads per inch of weft in loom = 72.

Threads per inch of warp in finished cloth = 76.

Threads per inch of weft in finished cloth = 80.

Width of warp in reed, in inches = 58.

Width of cloth finished, in inches = 56.

70 yards of warp produce 58 yards finished weight per yard of finished cloth = 13 to 14 ounces. Loss in scouring and finishing 9 to 10 per cent.

Note. The warp is a dark brown mixture. The cotton weft used is dyed dark brown or nearest shade to the mixture of the warp for subsequent finishing.

The design or weave plan is supplied at Fig. 24.

A cross section through the weft is shown at Fig. 23 (May issue), assuming we read figure 23 to represent a cross section through the weft instead of through the warp as originally employed in the example of the fabric which it accompanied.

A photomicrograph of the actual fabric is given at Fig. 25, which serves to illustrate the general and surface appearance of the fabric as well as to demonstrate that the warp material in the example given is the only bending yarn, the cotton filling being practically straight. The warp threads are compressed so that the peripheries of each succeeding thread is in contact with its predecessor. It is also the predominant and only visible factor in the rib or twill of cloth produced, since the warp is the distinguishing feature in the rib. Thus

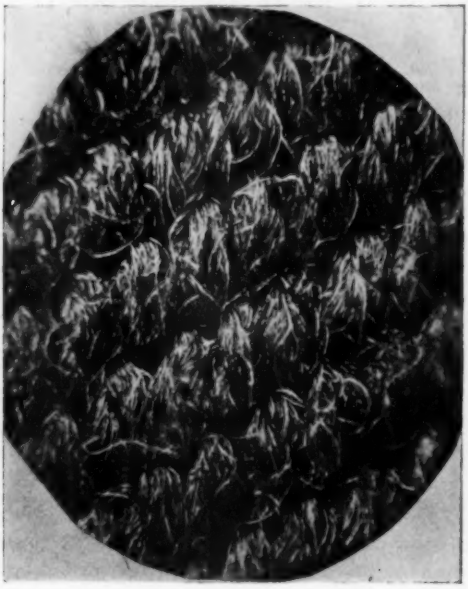


FIG. 25.

produced it is frequently and technically expressed as a warp rib.

Since the warp performs all the bending, the denominator of the diameter of the curved thread represents the number of threads per inch which the finished cloth may naturally contain, viz., 85, as set forth in formula IV. (Feb. issue).

Having thus theoretically determined the number of bent threads (warp) per inch, the number of straight threads (weft) per inch finished may be readily obtained by the application of formula III. (Feb. issue).

Total diameter of straight threads plus total diameter of interlacing threads in one repeat of the design divided by the number of threads in one repeat of the design equals the average distance apart of each straight thread of weft in the cloth, thus: $(7/104 + 2/85) \div 7 = [(2 \times 104) + (7 \times 85) \div (104 \times 85)] \div 7 =$ 1/77 or 77 threads per inch of weft.

Hence it follows that the fabric might have been produced so as to contain 85 threads of warp and 77 threads of weft per inch respectively. But since the normal setting of the texture has been modified, inasmuch as it contains 9 threads of warp less or only 76 threads per inch of the bending yarn, instead of 85 as above, this decrease in setting readily admits of an amount of compression which increases the diameter of the warp in the direction of the piece width from 1/85 to 1/76 inches which we may with justification assume to represent the diameter of the bent thread in its increased direction.

The above decrease in the number of threads of warp involves an increase in the number of threads of weft, though not in any direct proportion as previously stated, but subject in this example to the only changed factor—the variation of diameter.

Having determined the increased diameter we may readily find the decreased diameter by the application of formula VI. (May issue), thus: (Original diameter squared) ÷ (increased diameter) = decreased diameter.

Observe formula VI. is applicable for finding either decreased or increased diameter when one or the other is known, thus: $(1/85 \times 1/85) \div 1/76 = 1/85 \times 1/85 \times 76/1 = 1/95$ inch = decreased diameter of warp, which represents the thickness of warp at the point of intersection with weft.

Then having determined the decreased diameter of warp we may find the threads per inch by formula III. as before. $(7/104 + 2/95) \div 7 = [(2 \times 95) + (7 \times 104) \div (95 \times 104)] \div 7 = 1/79.2$ or approximately 80 threads of weft per inch as in the example of cloth given.

The foregoing method, it will be observed, is a rational means not only of illustrating that any increase or decrease in either set of threads involves the converse in the opposite set of threads, but of also determining the necessary amount of increase or decrease of threads according to such modifying factors as weave, angle of curvature, compression and changed diameters, all of which have been taken into consideration in the foregoing calculations.

(To be continued.)

Methods for Utilizing Odd Lots of Yarn.

A colored goods manufacturing concern, to be worked on a satisfactorily remunerative scale, must have all details carried out with a view to the strictest economy.

The yarn room and the warping room of a mill are often the scenes of laxity, and accumulations of varied lots or small quantities of disused counts and colors are found to be of considerable dimensions in a short space of time. The accumulations may be the leavings of completed orders, occasional miscalculations, or the yarn may come from the dyers in a state not satisfactory for the particular work for which it was intended, and a second supply correctly dyed leaves the first quantity on hand. This first quantity is often returned to the dyer, and the price taken off his account; but in other cases the yarn is left on hand to be used at the mill. A few manufacturers rid themselves of these accumulations by making a warp from the oddments of warp yarn, and picking it with the oddments of weft. This cloth, with its often objectionable combination of colors, is sold to the female employees, who wear it over their aprons; but any intervention of this kind tends to create a loose, slovenly disposition, which should be studiously avoided in manufactories where neatness of work is essential. Also, this method of using up the odd yarns detracts from their selling price as compared to their use in marketable cloth. Striped goods allow of the introduction of a considerable quantity of threads of odd yarns at the edges of the colored stripes. Threads of indigo much lighter in shade than the body of the stripe would pass muster if placed at the edge of a blue stripe at the positions where it borders on to a stripe of white. Threads of from two to four counts finer than the body counts are used in these positions; also blue stripes edged with dark green may be inserted without any conspicuous results.

When cloths are built with a preponderate amount of weft, colors of even greater distinction may be safely introduced in the warp. The alien threads should be placed at regular intervals across the cloth, and not used lavishly at the commencement of a warp, compelling the use of another kind at the finish, as any irregularity serves to make their introduction more conspicuous. The Oxford weave of cloth allows of the introduction of these threads if heavily wefted; but if only lightly wefted it is dangerous to venture far, because the two threads working together occasionally change positions, and a thread which is light and intended to edge the white stripe may occasionally come second in position, and appear rather prominently. Sateens and similar warp-faced cloths should be treated cautiously, as they show up the imperfections of the warp so clearly; but designs containing narrow stripes of two or more threads may be treated in so far as these stripes allow.

Matting stitches and corded stripes are found very accommodating, as fewer threads of a coarser count, or more threads of a finer count, can be inserted without the least fear of detection. Very coarse counts may be used in place of two threads in the

Oxford cloth, or a moderately coarse thread and a fine thread may be run together to substitute two threads of medium counts. For example: If an Oxford cloth be made from 32's counts of warp, and it contained a stripe the color of which was similar to that of some 24's, the 24's might be utilized by placing a thread of 40's as its fellow thread; the coarseness of these combined is so near that of two threads of 32's as to be unobserved.

In figured fabrics the weave of the cloth must be taken into account when introducing alien threads, because the weave has considerable influence in covering or disclosing the variations. In some weaves the edges of the stripes are thrown up very prominently, while in others they are subdued more than in the plainer weaves.

It is of great advantage to the management of the preparation department if the person in charge has some knowledge and experience of the woven cloth, because, in addition to the placing of odd threads in positions least inclined to show them, any tendered or soft-sized yarns might be placed in positions the least likely to carry the strain of the warp, or be subject to an undue amount of friction in weaving. In the dobby Harvard shirting the figured stripe is often principally composed of the calico order of weave and requires a well-sized and strong thread, because the figured stripe threads interweave frequently, and, as a natural consequence, take up more yarn than the ground portion, and bear all the strain in pulling round the weaver's beam. Another design may have a figured stripe working four picks up and four picks down; this stripe would work slack and take a more tender or soft sized yarn, or if a four end matting is used a tender thread would be easily carried through its work along with three threads of ordinary strength.

The accumulations of weft yarns also require vigilant attention, especially in cases where self-colored cloths are manufactured. Spotted hanks or weft yarn, not even in color, would show their imperfections very clearly if woven into self-colored cloth, but these can be used in many small checked patterns without risk of injury to the cloth. If the weft is too fine for a suitable checked cloth, another thread (the counts of which will bring up the imperfectly dyed yarn to the required counts) may be doubled with the fine counts. A twill checked cloth is often treated with odd weft in this way, as it is fairly well covered with the warp. The advantage of using oddments of weft is the safety with which they may be used, because a few picks may be inserted as a trial before proceeding to weave a quantity. Dark green and indigo, prune and indigo, and other mixtures have been inserted (instead of a coarse indigo weft) in a twill cloth, and still the difference in appearance is very slight.

A novel mode of using very coarse indigo weft in a twill cloth is to place one pick in a bar instead of two, as originally intended. This is done in an ordinary check loom, provided with a dobby, by placing one pick in the cloth and the return pick on the top; all the healds are depressed, in order to allow this to take place. When the next bar of indigo is required, the first pick is sent over the warp, and the second pick is inserted in the cloth. The shuttle is arranged to put a quantity of drag on the coarse weft, sufficient to take up the loose weft on its second return; also, the temples require to be set a good distance back, to prevent them gripping the loose weft.

Soiled white wefts are often used in the small white bars of a checked pattern, an extra shuttle being employed for this purpose. The designer may be of great service if he is in touch with the practical work of the mill; because, when arranging new cloths he can keep an eye to the introduction of those colors and counts of weft which are likely to accumulate from other cloths in course of manufacture; and especially when these are of solid color, as previously mentioned, the accumulations are generally large when

the best results are acquired. In order to double the yarns (which are required to be used instead of a coarser yarn), one of the winder's pirns may be arranged to wind the weft from two pirns placed in a vertical position, a little tension being placed on the threads in their course. These threads will require very little attention, as the weft is very unlikely to break during the unwinding from the pirns. The system described necessitates twice winding of the thread, but the extra expense is more than recouped by using the weft to greater advantage.

If persistent advantage were taken of every opportunity for using up the accumulations of odd warp and weft yarns, and every attempt was made to keep down the causes of accumulations, the yarn room of many manufacturing concerns would be less crowded, and better order, system, and economy obtained.—"Pick," in Textile Recorder, Manchester.

—The fat-tailed sheep that is so common about Beirut, Syria, is a great curiosity. The tail of this sheep sometimes grows so large that the animal to which it belongs cannot rise out of a sitting posture without assistance. We give the foregoing as an extract from a recent letter to us from U. S. Consul, Thomas S. Doyle, Beirut.

—When the proud city of Venice took the lead in fashion, and more especially in the domain of dress, black, and dark violet figured velvets, with powdered flower patterns, were popular among the nobles, and were very appropriate to the short Spanish mantles worn during the second half of the sixteenth century in the Courts of Europe.

—It is not assumed that fine fleece wool of itself will not spin as a warp, but the admixture of lamb's wool improves the spinning, and the two in combination will spin to a finer count and form a more even thread than fleece wool alone.

Good Soaps.

That a good soap is one of the most important factors in the finishing process, is too often underestimated, but, after all, the success or failure of the whole process depends in a great measure upon this very item. How often has the whole finishing room been bunged on account of a poor article in this line, to say nothing of the detriment the finisher's reputation has suffered, as well as the shrinkage in the profits to the manufacturer. To guard against ill results in the future it will be well for us to examine this question a little more closely in all its details, for it is only thus that we will be able to intelligently understand the question. That this question has received the careful and serious attention of the wide-awake manufacturers there is little doubt, but as the results arrived at on account of this attention are widely divergent, it is easily seen that the perceptive qualities of the investigator are not always up to the mark and it will not do to accept their conclusions as solving the question satisfactorily. Perhaps one man arrives at a sound conclusion where another goes off on a different tack and eventually lands in a worse hole than the one from which he tried to extricate himself.

The man who comes to the conclusion that he has to have a good reliable soap and therefore makes up his mind to buy of good and reliable parties only, and is willing to pay a fair price for a fair article, is on the high road to success, and there is little doubt that the troubles due to poor soap will be an unknown quantity in his establishment. A good reliable soap is worth more to the manufacturer than many are willing to admit, and once its importance becomes definitely known we imagine that most men would rather pay an increased price for a good article than to be bothered with the inferior kind. This kind of reasoning may not look business-like but when converted into actual practice, the soundness of the reasoning will be at once apparent in

the utter absence of all those trials and troubles in the fiuishing department, which are directly due to a poor soap. This will conclusively proove that the reasoning is sound and correct, and will pay every time, so long as this policy is adhered to.

Now then, while this man has solved the matter satisfactorily, another, starting his investigations from the same base, arrives at quite a different conclusion. He reasons thus: "I have had so much trouble lately in the finishing room on account of poor soaps, which seem all to be more or less adulterated, and I have made up my mind I'll have no more of it, and, therefore, have determined to make my own soap and thus be sure of what I use." With the advanced methods employed in soap making which should and may be known to manufacturers using soaps, this would seem to be not only a safe and profitable, but also an excellent reasonable, proceeding. But most of the men who have arrived at this stage of reasoning stop short and undo all the good which might accrue to them if their reasoning had been carried to a logical conclusion. Instead of inquiring into the best methods of making a soap suitable for the work in hand, usually the result is the buying of a barrel of saponified red oil from which he proceeds to make his own soap according to an infallible recipe given, most likely, by the drummer who is anxious to sell the oil.

Having mentioned red-oil soap it may not be out of place to inquire into the value of this article for the making of soap to use in the finishing process of woolen goods. Not only this, but a comparison of its relative value to other soaps used for this purpose will be found to be quite an interesting question. One of the first considerations is usually the cost of the article, when, for the good of all concerned and for the benefit of the manufacturer especially, this question should not enter as a factor at all, unless several equally meritorious articles will completely fill the bill. But between a good reliable article and an inferior one, the question of relative cost should not be considered for a moment, and can only be considered to the detriment of the goods. Having had some little experience in the making and use of this kind of soap we speak advisedly when we say that as far as cost is concerned one of the most grievious mistakes is made, for while it is held to be cheaper it is in reality dearer than a much better article. A gallon of saponified red oil will make about 30 gallons of soap of a fair consistency, but nothing extra heavy. It will make a soap which will perhaps answer for one to one and a half hour's fuling at the most. Taking the average cost of the oil to be 30 cents per gallon as per quotation for single-pressed saponified red oil in last week's market reports, would give us one cent per gallon as the cost for the oil, to say nothing of the alkali.

The extensive boiling which this soap has to undergo is another item of importance, but this like other little things does not amount to anything to the advocates of this kind of soap, for, as some of them have said, steam has to be kept up anyhow, but it shows small regard for the cost of coal, to say nothing of the value of time. As stated above, the consistency of the red oil soap made in the proportion of one gallon of oil for 30 gallons of soap is sufficient for 1½ hours fulling. In comparison we will take a No. 1 palm oil soap, such as can be bought of any reliable dealer for 5½ cents, or even less, a pound, we find that a gallon of soap of the consistency required for 1½ hours fulling can be made with two ounces of the hard soap. The cost of this would be 11/16 cents, or a saving in favor of the hard soap of 5/16 cents, or over a quarter of a cent per gallon of soap used. This is quite an astounding item, but nevertheless a true one. Now this comparison has not been picked out for a fact, but simply the trial has been made by the writer in the same mill, not alone to his own satisfaction, but also to the satisfaction of those employing him.

So far, we have not touched upon

the alkali question in the making of the soap. Without alkali, red oil will not turn into soap, no matter how long it is boiled, which goes to show that the alkali is required for saponification or rather combination, for saponification cannot be brought about by alkali. Perfect saponification, it may as well be stated here, can be brought about by causticized alkalies, such as caustic soda or caustic potash, and when these are used rightly, saponification takes place whether heat or steam is employed or not. Thus we find that part of the alkali required in the making of red oil soap goes to combine the oil and water into a semblance of soap, but just how much of the strength of the alkali is used in this way must always remain a mystery and must vary with conditions over which the maker evidently has no control, and therefore causes an unevenness in the article which is not at all desirable.

The relative merits of the soaps for the use to which they are put in the finishing room may now come in for a few words. The lasting quality of the body of the soap is the most important item, for upon this depends its softening uality, as well as the cleansing. Here is found one of the greatest evils of the red oil soap, for its lasting qualities are not as good as the body of the soap would lead one to believe. As soon as the soap gets cold it commences to separate, for as stated above the ingredients are simply combined and are sure to separate again after a time. They will never separate fully, but enough to detract greatly from the softening quality of the soap. By heating the soap, of course, it will combine again at once, but the use of warm soap has so many evils in its train that it should be strenuously avoided. Taking, then, even soap of the same consistency, there is again a large margin in favor of the higher priced palm oil soap. As said, the red oil soap lacks softening qualities, and it is a curious fact that it is mostly used on goods which need the softening influence of a good soap most, and that is the cheaper grades. A good palm oil soap should be used on these goods to bring out the best there is in them, and an olive oil soap is none to good for the finer grades of woolen. REAUMUR

Sheep in Cape Colony.

Consular reports from Cape Town give some interesting statistics to the State Department at Washington, showing that the number of sheep in Cape Colony for 1895 was 14,409,434. This shows a decrease in the number of sheep since 1891, of about 2,300,000. We have figured out the average weight per fleece from the statistics given by consular reports, showing that in 1856 the average weight was 1.27 pounds; in 1865, 1.93 pounds; in 1875, 2.57 pounds; in 1891, 3.35 pounds; and in 1895, 3.16 pounds. This increase in the average weight of the fleece would indicate improvement in breeding.

—In all Greek illustrations of handloom weaving found on pottery and elsewhere, and in all reference to it in Greek and Latin writers, it is always found in the hands of females. In India, a woman is not to be seen weaving, the whole work being done by males, whilst on Egyptian monuments both men and women were depicted as weaving. What is the reason of this, is not clear.

—Although Milan, in mediæval times, was more celebrated for her armour than for textiles, yet, at the end of the twelfth century, we know of the vast industry in woolen cloths that sprang up, as if by magic, under the teaching of the "Umiliati fathers," amid the ruins of the city, which was destroyed in the year 1164 by the Emperor Frederick. In the sixteenth century she was also well known for her velvets, laces, nets, cloth of gold, brocades and damasks.

—The sound wool alone should be used for warp, as strength is a necessity, whilst the tender and soft portions suit a weft and improve it by softness and bulk.

KNITTING DEPARTMENT.

The Knit Goods Situation.

June will prove the best month that the knit goods trade has had for a long period. It is all due to the arrival of seasonable weather. Many New York jobbers are working their employees up to 7 p. m. and later, in order to handle business promptly. War seems to cut no figure in either direction.

The demand in underwear is for duplicate light weights, such as balbriggans and gauze merinos. Retail stocks are so light as to make wholesalers radiant. In fact, it would be nearer the truth, to say that there are no stocks. Balbriggans ranging around $2.50 are generally oversold. Speaking of balbriggans, a call for fancies in that line is a recent manifestation. The inability to furnish the cheap to medium balbriggans is the outcome of the scare among manufacturers a month or more ago. Not receiving their usual duplicate orders they went to work on heavy weights.

It is now fortunately between hay and grass on fall goods, so the middlemen's efforts are not divided. No great change is looked for in fall prices. Raw wool is about as dull as it could be, but is lifeless rather than weak. Manufacturer's wool estimates for fall business were based below present prices and apparently nothing except foreign intervention in behalf of Spain, can send quotations down appreciably. The very cheap and very fine fall lines monopolize the full attention just now, principally the first mentioned.

The activity in summer underwear has extended into athletic goods. More women's sweaters are being called for than ever before, practically since the designs imitating shirt waists were brought out. Bright colors are increasing in men's and women's wear of this class, in common with most other apparel. The introduction of fine cashmere and worsted into these garments is largely responsible for the multiplying demand.

In hosiery the most important tendency shown is a reaction in fancies, which is not very marked, except in the cheaper grades and poorer designs. Stocks are so light, however, that this shift in sentiment gives no alarm. In expectation of a sudden veering, hand to mouth supplies have been carried. With a decided leaning of fashion toward bright variations, the better class of fancies will dispute sure-money power with gilt-edged staples, through the outing season, at least.

Patriotic novelties are plentiful. Golf hose are growing quieter, making them safer goods to handle. Seamless hosiery is worse off than anything else. With the present prospects the weaker kneed mills will soon be out of it. It is the cruel, but eternal law of the survival of the fittest. Only the finer grades of the best known producers are called for.

A buyer recently from Germany reports many of the tendencies there so noticeable on this side of the water of late, such as bright colors, extra neat stripes, clocks and embroideries, polka dots and fancy welts. The better grade of worsted and cashmere output seems to be supplanting fleeced goods. Fancies continue to be the rage there, which insures support of prices for many weeks. The buying abroad is rather slow, but cancellations are insignificant.

Splendid business is reported from the West by most of the New York traveling salesmen. More people are at work than for three or four years past, and heavy government orders are speedily expected. Domestic goods were never better made, but, unfortunately, cheap grades absorb most of the attention.

A Modern Hosiery Mill.

AN ENGLISH IDEA.

BY A PRACTICAL KNITTING-MILL MAN.

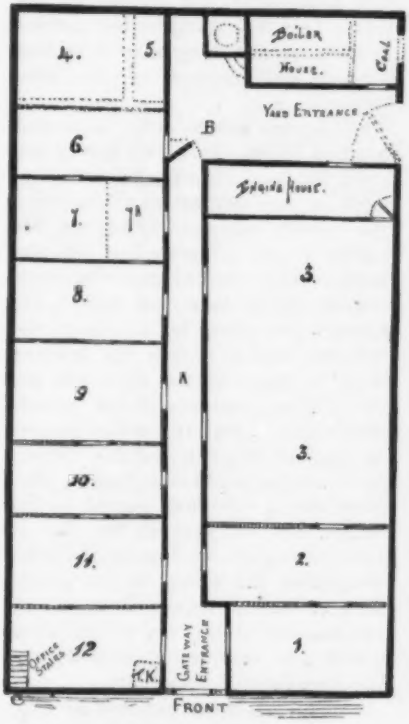
The advancement that has been made in the knitting industry since the introduction of steam power has necessitated attention being given to the mills wherein such industry is carried on. In large towns, where ground space becomes a considerable item, factories are built several stories in height. Such factories must of necessity, entail extra labor in the carriage of the material, in one form or other, from one story to the other. Many mills are now built in outlying districts where the question of land does not become so serious, and it is in the system of these factories that the most modern ideas are brought to the front; the chief point of consideration being the saving of as much labor as possible.

It is not intended in this article, to deal with the methods to be observed in regard to either the knitting or finishing processes, neither the best methods of fitting up each room, as this would entail too much detail and space; but only to deal with the setting out of a modern hosiery mill and to point out the advantages gained by the system advocated.

A present day modern mill is mostly of one-story with top northern light and of sufficient height to give ample space, and by a proper method of ventilation to be far more healthy than under the older system. It may be of advantage to have cellarage under a part of the mill and also to have a portion two stories, as will be seen in the explanation of the accompanying diagram which shows a ground plan of a modern mill. It should be explained that no scale has been adopted, it being used merely as a sketch to illustrate the description given.

Our plan is shown standing at the corner of a street having a main entrance on the front street and a side entrance on the side street, seen at the right. Such an arrangement allows of special entrance at front for work people while the engineer and stoker have a special entrance for coal, etc., near their boiler.

Let us take first a little supposition, and at the left hand corner "C" there may be a special entrance to an upper story extending over rooms 12 and 1, and the gateway. In these rooms all the usual business of the office may be carried on. There may be the private office, clerks' office, sample and sales rooms, each having by sliding eleva-



tors a connection with rooms 12 and 1, and if necessary a second staircase or winding stairs connecting the office over No. 1 room with the room below.

Let us before commenting further on these, start at the gateway entrance. There is an open space sufficient for ordinary drays to enter to deliver or take away as required. On the left, at "T K," is the time keepers' office where an official can check every thing that enters and goes away, and at the same time keep the check books

on the time of all employees. Usually a window in the office or a small door, enables him to see and check everything required. Here he receives all yarns, etc., which, after being entered, are delivered at the yarn room, No. 1. Under rooms 1 and 2 is usually a cellar, as some yarns are better kept in the cool and from the light. A yarn manager keeps here his whole stock of yarns and sees that each and all are used to the best advantage. Often the one in charge of this department will receive all the waste, keep it properly sorted and see to its being sent away after it is duly entered and checked by the time keeper.

No. 2 room is the order room and winding room. There all orders are given out from the order book and entered up each day by the clerk. Here the factory manager gives out his orders at set times to the different hands. The winders receiving their tickets, get the yarn from room 1, the knitters get theirs in turn from the winders, taking it into the knitting room 3, where at the front end are the knitting machines placed in suitable order. After the whole process of knitting is completed the various parts are put together to form a complete dozen, and then passed to the linkers and stitchers at the end of room 3, who put together all the parts completing the article in the rough. Such articles as require to be cut up are also cut at this end of the room which may be suitably divided from the remainder if required.

Now all goods are put into lots and delivered to a part of room 7, opposite. Here they are duly entered in a trimming book, which carries all particulars in reference to style of finish and all necessary details. Each lot receives its ticket containing similar details. After being here turned and tacked (if required), they then pass room 4, which is the scouring shed where all necessary scouring, milling and dyeing are done. This is a semi-detached room, in order that the steam may be properly carried away without entering any of the other rooms.

Room 5, also semi-detached contains the brimstone stones, for the purpose of bleaching woolen goods. Room 6 is the drying room where all the drying stones are fixed. Here are sent the goods requiring to be put on shapes, to be boarded and dried, while web or goods not so boarded are hung up in stoves to dry.

After drying they are taken to room 7 and pressed after being brushed, damped, etc., as required. Here they are finally shaped and returned to 7A to be checked, examined and passed to the making-up, mending, fellowing and papering departments, 8, 9, 10. In these rooms shirts would be fronted, pants etc. banded, and other goods made up; while those garments cut from finished fabrics would be entirely cut and made up and passed on for boarding, papering or boxing as required.

Room 11 is the stock room and order room. Under this room is the cellar, as most goods keep better in a cool atmosphere. Orders being completed are entered and passed for packing into room 12, where all goods are packed ready to be put on to the dray, again being checked by the time keeper, who can assist in the packing.

Thus the yarn has passed around, going through the various processes and finally sent out as finished goods at the receiving entrance, never having passed over the same ground twice except in cases where it was absolutely necessary for some exceptional purpose.

The time keeper sends in a letter slide all invoices up to the office, as does also the stock room clerk his entry forms. Every morning the order book is entered up and then kept in No. 2 room for the use of factory manager. The check clerk can each day, when checking, note the progress of any order in this department, and also at room 7A see what has passed into this department, and from same to the finishing department. Thus a daily check is kept and any order traced at once, even to the single dozen of any lot.

A word on the boiler and engine

house. The former is semi-detached with chimney behind it, while the engine house is in proximity to room 3. The advantage of this system is that from the engine, a main driving shaft can be run down the centre of the building over passage "A." Thus the engineer can see to all main bearings here without interfering with any of the knitters or others at the machines. From this main shaft any counter shafts can be driven as required.

As the time keeper has the charge of the main entrance, so the stoker has charge of the yard entrance.

The engineer has an entrance to all parts of the factory, as it is his duty to attend to all main driving shafts, belting, etc.

Room No. 4 should be open at the top to admit of the steam passing away, while the chimneys to the stoves in room 5 should be high enough to carry away brimstone fumes.

Such variations could be made from the plan given according to the class or branch of trade being done, but the example given shows the principles upon which a modern hosiery mill should be built, to enable the least unnecessary expense and to enable a check to be kept upon the orders as they proceed from one department to another.

A New Knitted Fabric.

We illustrate herewith a newly invented fabric, which can be either knitted or woven, though in this special instance we refer to it as knitted, designed especially for undergarments, such as undershirts and drawers. Figure 1 is a rear view of one form of fabric manufactured in accordance with the invention, and Fig. 2 a similar view of a slightly modified form thereof. As will be appreciated, the requirements necessary to a perfect fabric of this class are, first, warmth, and, second, a capability to absorb and carry away from the surface of the body of the wearer the moisture that exudes therefrom in the form of perspiration. To meet the first of these requirements, soft wool has usually been employed. This material, however, while affording the maximum degree of warmth, has been found more or less objectionable in practice, principally because of its high degree of elasticity, its shrinkage, its great cost, and its lack of the requisite degree of absorbent qualities. To obviate these several objections, while at the same time retaining the heat-non-conducting qualities of the wool, it has been the custom to combine with such material, either in the

Fig 1.

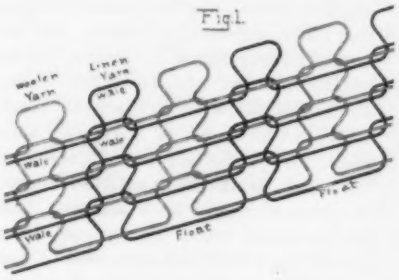
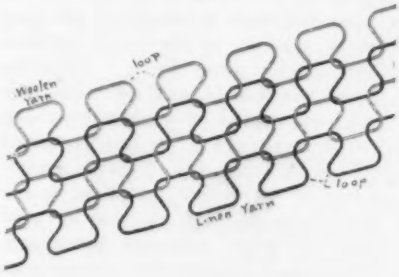


Fig 2.



yarn or otherwise, silk, cotton, or other materials. The several materials thus employed, however, while serving either to strengthen the fabric and restrain its elastic capabilities within the required limits, as is the case with the first, or reduce the cost of the fabric, as is the case with the second, have, like the wool itself, not posessed absorbent capability to the requisite degree, and even if they had their disposition within the fabric have not been such as to enable them to carry away from the inner to the outer side thereof the moisture taken

up by the former. With a view to overcoming the objections incident to the use of these materials in connection with the wool in the manner above pointed out and to meeting the second of the above mentioned requirements it has been essayed to manufacture the fabric wholly of cotton or wholly of linen. With the first of these materials the result sought has not been accomplished, owing to the fact that the absorbent capability possessed by it is so small that when the moisture given off from the body by perspiration is at all profuse only a small percentage of it is taken up upon the inner side of the fabric, the remainder being left in a "puddle," so to speak, upon the surface to flow down along the same or dry at the place where exuded, as is the case with wool. With the second of these, on the other hand, the maximum degree of absorption has been attained, and the moisture taken up by the inner side of the fabric has been readily carried through its body to the outer side, where it has been either dissipated by the layer of air between the inner and outer garments or else conveyed directly to the outer garment and carried away by it. With the linen, however, as with the cotton, the requisite degree of warmth has been found wanting, and for this and other reason it has not been generally adopted. To obviate, therefore, the objections incident to the use of wool and the other materials mentioned, either alone or under the arrangement above pointed out in the manufacture of fabrics of the class mentioned, and at the same time produce a fabric which shall possess the maximum degree of warmth and capability of absorption with a minimum degree of cost, are the objects of this fabric.

To these ends the invention consists in a fabric which is composed of wool and an absorbent material, the latter being so incorporated with the former that in the completed fabric it extends from the interior to the exterior thereof through the same.

With the fabric shown in Fig. 1 the woolen and linen yarns are so interknitted that the longitudinal rows of loops, or what are known in the art as "wales," of the linen yarn are alternated with the longitudinal rows of loops or wales of the woolen yarn, whereby the two appear upon the front of the fabric in alternate stripes extending longitudinally of the same throughout its length, with the yarns connecting the loops of the adjacent rows or wales of each extending across the backs of the intermediate rows or wales of the other in the form of floats.

With the fabric shown in Fig. 2, on the other hand, the transverse rows or courses of loops instead of being composed of alternate rows of the linen and woolen yarns, as in Fig. 1, are severally composed of loops of yarn of the same material, with the yarns composing the successive transverse rows of courses of loops alternated with one another, whereby one of such rows or courses will be composed of woolen yarn, the next row or course of loops will be composed of linen yarn interlocked with the first, the next of woolen yarn, interlooped with the second, and so on, each transverse row or course of woolen loops being followed by a transverse row or course of loops of linen yarn and each transverse row or course of linen loops in turn being likewise followed by a transverse row or course of woolen loops in alternation. In both of these forms of fabric, however, the two yarns appear upon both sides thereof and pass from the one to the other through the body of the same, whereby, in addition to affording the requisite degree of warmth and bringing the wool in contact with the skin of the wearer, the moisture given off by him in the form of perspiration is taken up by the linen and carried through the fabric to its outer side, where it is either dissipated by the layer of air between the under and the outer garments or else transferred to such outer garment to be carried away thereby.

The fabric can be knitted in the form of a double-ribbed fabric, which shall

be suitable for sweaters and other like articles, by feeding the same yarn to both sets of needles of a double-rib-knitting machine and using for such yarn a woolen one at one course and a linen one at the next, and so on in alternation, whereby in the completed fabric these alternate rows or courses of loops of woolen and linen yarn shall appear on both faces thereof as alternate stripes extending transversely of the fabric and passing through the same from one face to the other.

From the foregoing it will be seen that a fabric can be produced which not only affords the requisite degree of warmth and action upon the skin of the wearer, but one which possesses the capability of taking up and carrying away moisture in the highest degree, the first two of these characteristics being accomplished by the presence of the wool and the last by the pressure of the linen, which possesses absorbent capabilities to the maximum.

Technicalities of Power Knitting.

JAMES H. QUILTER.

Having in a few previous articles shown what is neccessary in the loop forming part of jack and sinker frames, it is neccessary now to deal with the mechanism that brings about such results as required. Few of those working any particular machine look with more than a passing glance at the why and wherefore of the results that pass continuously before them. Few mechanics are knitters, and few knitters are mechanics, still it is neccessary for the mechanic to understand the principle of loop forming if he is to adjust his mechanism for that purpose; and on the other hand a knitter should understand enough of mechanics to enable him to properly adjust his machine and keep it so after it has once been set.

The writer can call to mind many incidents that have occurred whereby both time and money have been wasted through the lack of even the slightest knowledge of the most necessary combinations. For instance, in rotary frames, cams have been spoiled when only the slightest adjustment would have remedied the evil that then existed.

It is intended in this article to show how the proper position of the loops are obtained on the present day rotary jack sinker frames so largely used in the trade, showing the various points that require attention.

This kind of rotary frames has horizontal needles, fixed and stationary needle bar, the jack and lead sinkers standing perpendicularly between them, usually alternate with each other. The first commencement of forming a row of loops, is to lay the thread in its proper position on the needles. The thread guides are so arranged to do this as they travel across the needles. The second and simultaneous requirement is the forming of a loop over each needle. These two movements are distinct from all others by reason of there being movements that pass from side to side of the machine.

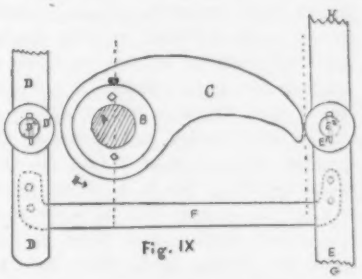


Fig. IX

This being so, they are controlled from a separate shaft known as the drawing shaft. This is usually a short shaft working at right angles to the main cam shaft which extends from side to side of the machine in the lower part of the framework. It is to the main cam shaft that the first or principle rotating motion is given, by connection by gear wheels from a short driving shaft on which are the usual fast and loose pulleys on which the driving belts work.

The main cam shaft, being the primary mover, has a revolution to each set of movements required to form a

course or row of knitted loops, but the drawing shaft, as explained, only controls the laying of the thread and drawing of the jacks for the purpose of forming a loop over every other needle. All the movements of the carcass of the machine being stationary during this time, it will be seen that such a cam can only work a portion of its revolution and that such revolution must extend over two complete revolutions of the main cam shaft.

Fig. IX shows the drawing cam, "A," being the cross shaft running at right angles to the main cam shaft, which is driven by bend wheel connections, so sized as to give the shaft "A" just one half the speed of the main cam shaft.

What constitutes the draw is a most important item to consider, as this varies on each frame. The thread carrier must travel the whole distance across each division, resting during the manipulation of the traverse of the loop along the needles, in the centre of each division, out of action of any of the forward movements of the frames. So too, must travel the slur cocks to lift up the tails of the jacks, so that the sinkers fall between their respective needles and form a loop from the thread laid. Now let "E" represent the main lever as attached by arms at the upper end "H" to the carrier slide carrying the whole of the carrier needles, of which there are one for each division. Now this lever "E" works at its lower end "C" on a fulcrum. The upper end "H" thus has a backward and forward draw, now a second lever "D" is attached to the slur boxes, and as this requires the same kind of movement it is linked to lever "E" by the cross link "F." By this arrangement both levers "E" and "D" can receive their movement from one source, which is the cam "C," or drawing cam, which works on the cross shaft "A," being secured to the flange "B" which is secured to shaft "A" by set screws.

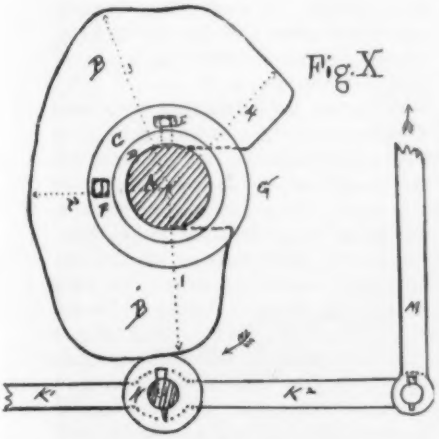
The shape of the cam "C" is different for each frame. Its draw, from centre of shaft "A" to point of cam, depends on the width of the division of the frame. It must be such as will bring the carrier and slurcock as previously stated quite clear of the selvedge jacks or sinkers. Again, its shape must be such that the cam itself is only acting upon trucks "D¹" or "E¹" at such time that they require to move which is usually not quite one-fourth of the revolution of the shaft. The cam, by working on the trucks "D¹" or "E¹", in turn, draws the levers "D" and "E" in both directions, the trucks "E" and "D²" being attached to their lever by working on a set pin.

It may here be mentioned that in order to give a correct and steady draw the trucks "D¹" and "E¹" must work freely. Any wear of the pin prevents the true revolving of the truck and the cam becomes worn unnecessarily, the lever "D," though working in unison with the lever "E," as regards its movement by the cams, still has a different movement at the point of draw. Though the thread guide and the slur cocks each have the same distance to travel, viz., across each frame division, still it is of the utmost importance that the thread carrier shall be first to move having moved a sufficient distance to lay the thread over several needles before the jacks commence to fall to form the loops. This is provided for by the lever "D" being attached to the slur box by a slide. Thus the carrier slide commences its movement in one direction, and until it has traveled its distance the slur slide does not move. This is one of the most important items in connection with these draw movements. The cam itself is a set movement arranged according to the width of the machine and requires no alteration, but the lead must be such that the sinkers fall properly on to the thread, and the thread must fall properly over the selvedge needles, if a perfect selvedge loop is to be made.

The draw cam having done its work, the levers "D" and "E" remain stationary while all the various positions of the loop on the needle are gone through to finish the row of loops.

In rotary frames all these move-

ments come under four distinct movements of the face of the frame and one of the pressers. These four movements are, forward and backward, upward and downward. This is apparently simple, but each of the movements are subdivided. The forward movement of the new and old loops have each their separate position of, first, the new under the beard, the old behind it; second, the old on top of the beard; third, the final passing of the old loop over the new one; and fourth, the backward movement to the original position. The up and down movements are subdivided, first, to divide the loop; second, to have the loop in



position on the needles for pressing; third, the downward motion to take the new row of loops on the throat, and upward movement to their original position ready to again commence a course.

It is now proposed to treat of these movements mechanically as supplied from a set of cams on the revolving main cam shaft, dealing with each cam and its proper position, and which is needed for every knitter to understand in order to adjust the same for the true working of the machine. It has been shown how necessary such a knowledge is, if time and trouble are to be saved, and it is hoped these few hints and suggestions may be the means of such advantage as their knowledge must bring.

The first cam to take into consideration is that which regulates the up and down movement of the face of the frame. This is known as the sinking cam. There may be two or more of such cams controlling the frame, equally, from side to side. Fig. 10 shows this cam on the shaft "A," which is the main drawing shaft fixed in the lower part of the framework of the machine and extending the whole length, working in bearings on the main standards. Revolved by gearing from the driving shaft in the cam proper "B," which like all other cams is not fixed to the shaft itself but to a boss, which is on the shaft. This boss is shown at "C" having the flange "D" through which goes the screw "E" to secure the boss to the shaft. The cam "B," being cut away at "G," fits on the shaft and is secure to the boss "C" by screws, one of which is shown at "F." These are so arranged, as shown, so that each cam can be set in its true position. This cam acts upon the truck "H" working on a pin on the horizontal lever "K," the one end of which "K'" works on a fixed bearing, usually on the back casting of the machine and so obtains a fulcrum on which it works up and down. The other end "K²" is attached to the perpendicular lever or rod "M," which is attached to the machine, usually to the cross arms of a cross bar connected to same.

It will be seen that by such a connection, any action the lever "K" allows, pulls down the face of the frame, because by the hanging cheeks hanging from the front end of the cross arms carry all the parts included as the face in the meaning of the word as far as it has to do with the action of the lead or dividing sinkers. Our sketch Fig. 10 shows the sinking cam as it stands at the completion of a course with the sinkers, with their nibs slightly above the level of the needle ready to descend on to the thread that becomes laid under them. Now as the cam shaft revolves in direction of the arrow, the cam is practically out of action till part "4" comes again to act upon the truck "H." This has al-

lowed the lever "M" to be stationary, and so the face of the frame during the motion of drawing as already explained.

Now, by the shape of the cam, the face of the frame comes down so as to bring the lead sinkers to their dividing position, with the nibs that distance below the needles, according to the loop that is required. From this position they rise until they reach "2," where they are at their highest point; now descending to their lowest when they have knocked over, rising slightly to their first position as shown.

One important point in all this is that the truck "H" should have an equal bearing on the cam during all of its course, and that the truck should run free and true so as not to give undue friction on the face of the cam. This is provided for by special springs to lever "K" to keep it in position. It will at once be seen that the cam face, if once right and the cam properly timed cannot be always getting out of order, and, therefore, does not always require a bit taken off here or a bit put on there. Anything wrong must be looked for in another quarter, as the cam having shifted or some such cause. Cams will wear, but if, as stated, the trucks run free and work equal friction, there the truck can be adjusted to take up any wear that may occur.

To be continued.

—Tops should be examined to see that they are free from neps and motes, since these always detract from the appearance of the yarn by riding on the surface.

—Strength of fibres and softness are features which largely determine the spinning powers of the wool. A soft, flexible top possesses much more drawing power than one which is horny and stiff.

—After being combed and converted into tops, the next process through which wool passes is the drawing, and this may be said to be the most important operation in the series preparatory to the formation of the thread.

Devices for Knitting Machines.

There are several inventions that have made their appearance within the last month, that we would gladly illustrate were it not for their elaborateness. At this time we call attention to two of them, one relating to the device for feeding thread or yarn to a knitting machine, more especially to means for introducing a reinforcing or splicing thread or yarn at certain portions of the knit fabric, as, for instance, above the heel and upon the sole of the stocking One of the objects of the invention is to provide a reinforcing mechanism which may be readily attached to or detached from the knitting machine. The mechanism is not limited to any one form of machine. The inventor is James E. Rowe, Pawtucket, R. I.

The other invention that we desire to allude to relates to a class of knitting machines which are intended for the production of striped fabrics by the use of continuous knitting-threads, the thread or threads not in use floating on the inner side of the knitted tube from stripe to stripe. In such machines a series of thread-guides are employed, one for each of the threads used, and these guides are controlled by mechanism whereby the feed end of either guide may be moved into or out of range of the needles, so that any desired thread may be fed to the needles throughout as many courses as may be desired. The objects of the present device are to provide simple and efficient means for operating the thread-guides, to prevent engagements of the floating thread or threads by the needles, and to provide for the removal of the needle-cylinder with the work thereupon from the machine so that it can be applied to a different machine for the formation of the foot portion of a stocking. The names of the inventors are L. N. D. Williams and H. Swinglehurst, Jr., of Philadelphia.

—Whether or no, as some believe, the Greeks were the first who spun and manufactured asbestos, it is certain that this mineral was used by them for a variety of purposes.

The Harvard Knitting Mill.

The Harvard Knitting Mill was established in 1888, at Cambridge, Mass., under the firm name of Winship, Boit & Co. In 1889 the concern moved to Wakefield, Mass., renting a floor in the building known as the Wakefield Block. In 1891, their business increased so they were obliged to take another floor in the same block. In 1896, they again were obliged to take more rooms in the same block, and in 1897, they found it necessary to still further increase their business by the erection of the present mill herewith illustrated, which was started in October of that year. Their new mill is built upon one acre of land, in the centre of the town, near the station of the Boston & Maine main line.

The main building is of brick, 182 ft. long by 50 ft. wide, three stories, and a basement; also a wing, two stories high, 30x40, and two towers, 27x17, one at each end. The latter are used for stair ways, and the one at the front of the building is used also for a water tank for automatic sprinklers.

The basement is used for the storage of yarn, etc. On the first floor, at the front of the building, are two offices, One main office and one private, each 16x16 feet. The folding, packing and shipping are done on this floor.

On the second floor is the finishing department, and the third floor comprises the knitting room.

The first floor of the wing has the boiler and engine room. The engine is of 50 horse power, made by E. P. Allis, Milwaukee. The boiler is a 80 horse Robert's boiler, with Sidney Smith's method of setting. On the second floor of wing, is the waste and brush room.

THE HARVARD KNITTING MILL, WAKEFIELD, MASS.

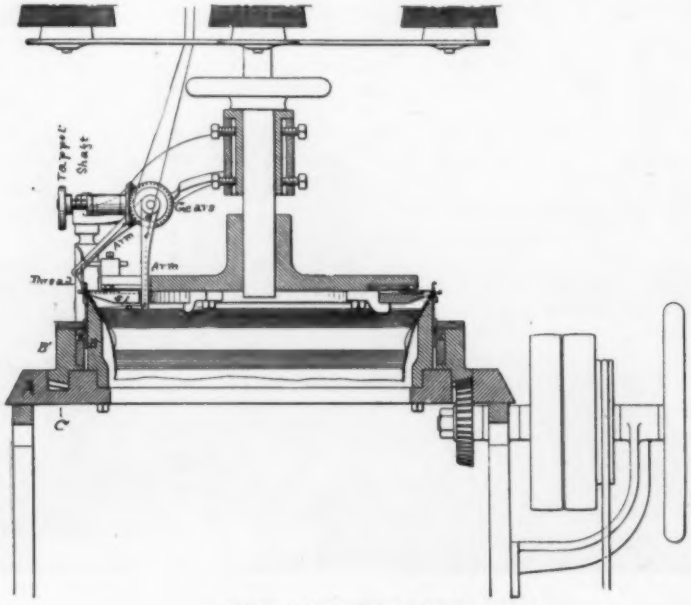
The building is heated by the Sturtevant hot air system. In the Knitting room there are 92 knitting machines and 12 winders. In the finishing room there are 80 sewing and eight looping machines, employing 170 hands, with a capacity of 300 dozen goods per day, including cotton, cotton and silk, worsted, worsted and silk, men's, ladies' and misses' goods.

The goods are sold by Wm. Iselin & Co., of New York City, direct to retailers.

Yarn Changing Device for Rib Knitting Machines.

We illustrate herewith a yarn changing device for a rib knitting machine, recently invented, the object of which is to produce by continuous operation and with unbroken threads tubular-ribbed knitted fabrics having stripes extending around the same.

A sectional view of sufficient of a rib-knitting machine is shown to illustrate the means which have been devised for carrying out the invention.



YARN CHANGING DEVICE.

"A" represents part of the fixed table or bed of the machine; "B," the usual fixed needle-cylinder, grooved for the reception of the vertically-reciprocating needles, and "B'" the rotating cylinder or cam-box, having cams for effecting the reciprocation of the needles, so as to cause them to engage with the thread and form stitches. The cam-cylinder has at the bottom a bevel-wheel "C" which meshes with a bevel-pinion on the driving-shaft. When in the outermost position, the thread carried by one of the arms is fed to the needles and forms the stitches; but when the arm is in the innermost position the thread carried thereby is drawn inwardly beyond the needles and simply floats on the inner side of the knitted tube which is being produced. When it is desired, therefore, to change the thread which is being knitted to form the fabric, it is only necessary to effect a quick reversal in the position of the arms when in line with the radial slot in the dial, and such reversal is effected by the action of lugs of the post upon the tappet of the shaft.

In order to restore the arms to the position shown in the diagram, the post is lowered, so that its upper lug acts upon the tappet and restores the same to its former position.

By this invention one is enabled to produce a tubular-ribbed fabric knitted continuously and with unbroken threads. Hence by varying the color or shade of the different threads one is enabled to produce stripes running around the fabric, a result which, so far as we are aware, has never heretofore been accomplished with unbroken threads in tubular-ribbed work.

Streaks, Stains and Mildew, Etc., on Underwear.

It is noticeable this year, that the knitting mills are making a class of underwear which excels in several features anything made previous years in texture, style and finish. Mills which have been erected of late, as well as some of the old ones, have been equipped with the best and latest improved machinery. The result is that a far better grade of goods is manufactured. Formerly many of the mills which made a certain line of goods, turned out such inferior work, that the product appeared much coarser then it really was, and would often be rated a couple of gauges under, thus showing what I have advocated of late, through the columns of your journal, of the necessity of a change.

A short time ago I promised an article on stains and mildew, which of late have come under my observation in mills where I have had to go for a few days to see if I could discover where or how these defects occurred. I will say that in the handling of woolen, worsted or cotton goods, there are many places where this evil may arise, that a systematic treatment of such is out of the question. But as they come to one's notice from time to time there is an opportunity to take up and deal with them as the occasion demands.

Not long since, I had quite a struggle in a mill for a couple of days with a line of children's fancy underwear, before I discovered the cause of the damage. The first thing we did was to examine the finished garments and study the peculiarities of the defects; but, we obtained no clue as to the cause. In the end we had to use the greatest of vigilance all along the line, and by careful observation the seat of difficulty was discovered and rectified.

In determining what might be the cause, which would or could lead to such a condition of things, we were forced to look through the whole process, and it may not be amiss to state some of the points of interest. First, streaks in the cloth, difference in twist, tension on the yarn, etc., are fruitful sources of streakiness; and yarn unevenly twisted, with heavy and light places, will surely make streaks. Yarn spun on different machines should in no case be mixed on the winder or knit together.

BLOTCHES OR STAINS ON COLORED UNDERWEAR.

One of the most prolific causes of blotches or stains on colored underwear is the knotting or bunching of the garments in washing, and if not straightened out, bad results will follow. In this way those parts of the goods which are most in contact with the friction rollers, knockers or sides of the mills, and which are most exposed to the fulling influences will show up different effects from the other parts, and the appearance will be in the shape of large, dull blotches, and look as if they were not properly washed. Of course to remedy these defects, soap must be applied uniformly, and if possible the garments should be opened out or loosened frequently, and not allowed to get entangled, as I have often seen it happen. Oftentimes it takes so long to straighten out the goods that the liquor gets cold and the goods chilled. The best thing to do in such a case, especially if the goods are fancy colors, is to run the liquor off, and start anew with weaker liquor than the first, if they have been washed for any length of time; but if they are of white, or solid colors the liquor might be saved by adding a little more with hot water; watching them closely when they are clean, so they won't get fulled, and rinse them as quickly as possible, if wool goods. If the garments are fancies, be careful not to put hot soap on them, unless you are fully satisfied the colors are perfectly fast, for if you do you will have spotted goods, which is difficult to be made right.

Mildew stains are the product of a fermentation, caused by moisture and heat, whereby fungi are produced

which not only destroy the colors but by advanced development the material also. Whenever wet a moist material is allowed to lie for any length of time in a warm temperature, there are conditions for the development of mildew; especially when the garments are piled up in heaps, as is oftentimes the case in the washing and drying room, as particularly in the latter when they are short of frames. The pressure of goods, one above another, presents a free access of air, and at the same time creates heat. Goods before they are washed, when taken from the menders are often times piled up in hundreds of dozens in the wash room, or some other damp place, for days and weeks, gathering mildew, and when they are washed are spotted and discolored and every one wondering how it happens the goods are not clean, while if racks had been placed in suitable places the goods might not have been injured.

Mildew is most frequently found upon gray or white cotton goods. Mildew is often found on some grades of colored. There is nothing more apt to cause fermentation and the growth of mildew, then the impurities naturally adhering to the fibre, and especially wool, and those which have been deposited upon the fabric in the course of manufacturing.

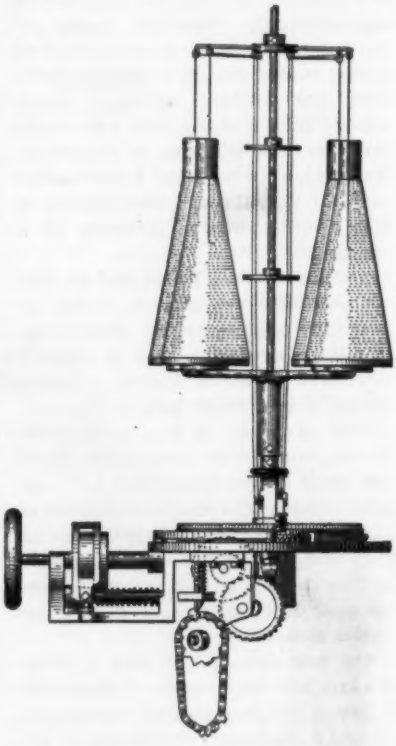
There are three stages of mildew; first, its rudimentary state, which may be removed by energetic washing or coloring; second, the fungus growth that cannot be removed, in spite of all that one may do, as the stains will remain; third, where the growths have acted upon the goods, which become weakened or, one may say, burnt, as the garments are irretrievably spoiled.

A word to the manufacturer. In order to protect himself, let him before anything else, see that the goods, either in a crude or washed condition, lie no longer in any department than is absolutely necessary. Should any accident occur to cause delay let him dry the damp or wet garments as soon as possible, and not let them accumulate in a wet condition in warm places.

A. SCOTLAND.

Plain Rib and Tuck Knitting.

An improvement in knitting machines has recently been invented, having for its object the production of a machine so adapted as to produce in a novel manner a fabric presenting at desired intervals plain rib and tuck, or royal rib, knitting. The illustration which we give herewith shows the side elevation on a small scale, of a knitting machine containing the device.



PLAIN RIB AND TUCK.

Rib-knitting is commonly done on two sets of needles, and when the fabric is to be made of that form called "tuck" or "royal" rib it has been customary to place the needles of one set in such position with relation to the thread guide or guides used to supply such needles with thread that said needles will receive the yarn, but will not be immediately withdrawn far enough to cast off

their loops and knit, said needles, however, knitting when brought into such relation to a second thread-guide that they may receive thread, the needles casting their loops and knitting after they have taken the thread from the second thread-guide or from the same guide the second time as when there is but one thread-guide. The thread-guides referred to always supply threads to the needles whether knitting tuck or royal rib or plain rib. In this way it will be seen that when tuck or royal rib is being knitted the needles actually knit only at alternate thread-guides, and consequently only half the number of courses will be knitted as when plain rib is being knitted, for during the knitting of plain rib every needle knits its thread before taking another thread.

The object of the present improvement is to keep up the product of this class of machines and knit as many courses when working the machine for tuck or royal rib as when knitting plain rib, and this object has been effected by providing the machine with a plurality of auxiliary-thread guides, each having its own thread, said auxiliary-thread guides having combined with them auxiliary cams to operate the needles to knit only while tuck or royal rib is being made, the needles at such time taking thread also from the auxiliary-thread guides. These auxiliary cams are placed under the control of a pattern-surface, and they may consequently be brought automatically into operation at any desired time. The auxiliary threads put into the fabric when knitting tuck or royal rib are cut off by a suitable cutting device when plain-rib knitting is to be resumed, and the cut end of the thread leading to the bobbin is held by a suitable clamp or holder, so that it will not fly out of the guide.

Heretofore it has been customary in machines adapted to knit plain-rib and then tuck, or give a royal rib stitch, to have, we believe, two feeds to regulate the dial needles when the tuck or royal rib stitch was to be done, so that they would take thread for the tuck stitch at one of the continuing feeds and knit a thread off at the other of the feeds. In consequence, the fabric being knitted grew in length only one course for each rotation of the machine. This, it is claimed, reduced the production of the machine while running it to knit tuck or royal rib, and in order to obviate this loss of production there have been added in this invention, auxiliary cams and feeds.

Device for a Revolving Cylinder Knitting Machine.

An invention has recently been effected for use on a knitting machine cylinder, having a central tubular hub or sleeve, that turns on a bearing stud.

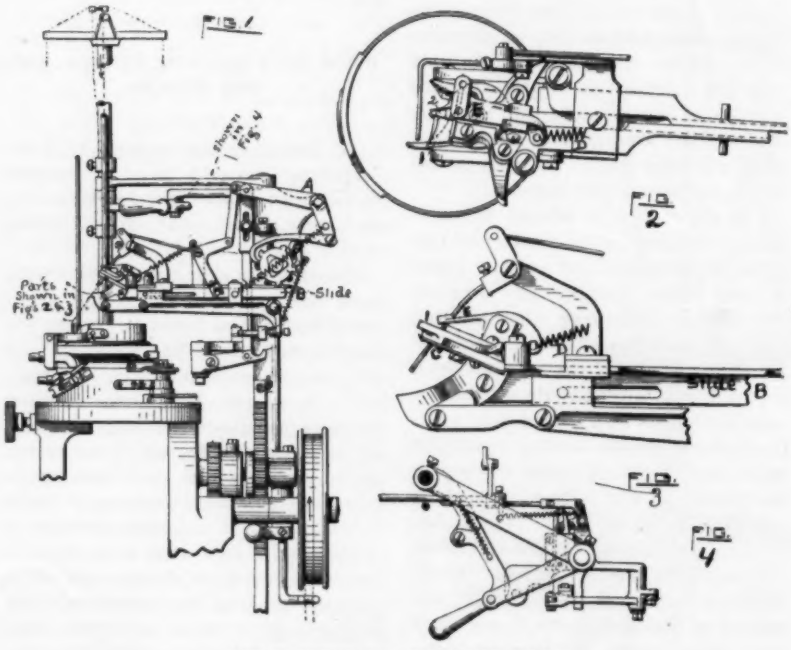
Hitherto the cylinder and hub have been cast in one piece, being afterward turned and bored to receive the needles and stud. The sleeve or hub has gear-wheels clamped on it, whereby it is driven. In practice it often becomes necessary to change the size of the cylinder. For this purpose the gears are loosened, the cylinder is lifted off the stud, and anothed one is substituted: but as each cylinder is made for its own stud such changes result in imperfect fitting, and as a consequence both the cylinder and the stud are worn so as to injure them. Indeed, a cylinder which has frequently been changed in this way will rarely run quite true on any stud. To obviate this defect, the hub or sleeve of this device is made detachable from the cylinder in order that the hub and gears may be left in place and the cylinders exchanged without disturbing the accurate fit of the sleeve and stud. For lubricating the bearing-surface the stud is made hollow, with perforations whereby the oil supplied to the interior of the stud may pass out over its exterior, which is in contact with the interior of the hub or sleeve.

Attachment for Changing Yarns on Knitting Machines.

In knitting stockings or other forms of knitted fabric it is frequently desirable to use yarns of different color or quality in different parts of the article produced, and in order that this may be accomplished economically and without loss of time the change from one kind of yarn to another should be done automatically and without interfering with the continuous operation of the machine. The device here represented relates to an attachment for thus changing the yarns, and has for its object the production of such an attachment which may be readily applied to machines now in use and which shall be simple of construction and accurate and positive in action.

The improvements embody yarn-guides through which the yarns pass to the main yarn-guide, holders for holding the free end or ends of the yarn or yarns not passing to the needles, and means for carrying the yarns successively to the needles. In the preferred form of the improvements shown, the guides and holders also act to form the thread-carrier for carrying the threads successively to the needles.

In illustrating one mode of applying the present improvements to a knitting-machine, operating mechanism is shown which is so timed that the threads are changed at the heel and toe of the stocking; but other forms of operating mechanism may be used and the operating mechanism may be so timed that the yarns will be changed as often as desired, and at any portion of the fabric being knit.



ATTACHMENT FOR CHANGING YARN.

Fig. 1 of the accompanying illustrations is a side elevation showing the present improvements, and as much of the knitting machine as is necessary to illustrate the application of them. Figs. II and III are a plan and a side view, respectively, of the parts carried by the end of the arm as noted in Fig. I; and Fig. IV is a plan view showing the mounting of the attachment and the mechanism

for operating the parts, as also indicated in Fig. I.

We think our readers, by studying the illustrations will be able to understand the functions of the new devices, without any detailed description. We will state briefly, however, that the thread passes on the usually stationary guides and take-up, through the thread eye, which does not travel with the cylinder, and at this time acts as a stationary guide from which the thread passes through the thread guide to the needles, and the thread passes from the stationary guide and take-up through the thread eye, and its end held up by the jaws. As seen in Figs. II and III, at 1 and 2, when the threads are to be changed, the arm "A," in Fig. I is turned down by some suitable means, thus moving the slide "B" forward and rocking the plate "C" (Fig. 3) upon its pivot. This movement of the plate will cause the spring "D" (Fig. 3) to rock the plate "E" (Fig. 3) on its pivot, and thus carry the end of the arm away from the plate.

—We have a communication from a United States official in Europe, advising us to "bang away" at the consignment system so largely in vogue in this country among agents of European manufacturers. Those who lend themselves to this method of securing American trade are looked upon by this correspondent, as robbers. Another great evil of the whole system, says he, is the combination of ad valorem and specific duties. One or the other, in his opinion, would be wiser than both.

A case has just been decided by the Supreme Court of the United States, affirming the decision of the Supreme Court of Utah, relating to the constitutionality of a statute of that State, holding that eight hours is a legal day's work in mines, smelters, etc. This decision has its importance, in sustaining the constitutionality affecting the hours of labor.

From Chemnitz.

UNDERWEAR.

Hohenstein, Limbach and Chemnitz are running full time. Limbach was fortunate in booking big orders for one of the best houses in the United States. The goods are excellent, the prices fair. It is pleasant to record the fact that United States buyers believe the very best to be none too good for their patrons. One of the first causes for a decline in the desire and demand for fancies is due to the poor dyes and bad yarns that went into goods shipped last fall. Americans will wear what is good and true. Hosiery that leaves patterns of plaids all over ladies' legs is doomed. The fast blacks of this city did more than any other factory to bring buyers to this city.

The samples of goods collected by the commission sent out some time ago to look up China, Japan and the East are on exhibition in the Technical High School of this city. No one, except a subject of the empire is admitted to the exhibit. This indicates as perhaps nothing else could or would the sublime size, magnificent, mental proportions, gigantic intellectual development etc. etc. of the parties in charge. Foreigners may not see the selections. By the way, to make it attractive, one William Janssenn, a broad minded manufacturer in this city, loaned the exhibition committee, a beautiful collection of carved ivory, and Stephan Clauss loaned some marvellous Japanese and Eastern tapestries. Some one was wicked enough to say that Janssenn's ivory and Clauss's tapestries were by all odds the very best parts of the whole show. Be this as it may, no foreigner need apply. I hope, notwithstanding all this, to give you a detailed report of the exhibition, i. e., if I find it worth while. If the reports that have reached me already, are true, I shall hardly take the time to report it. ARISTIDE.

POWER DEPARTMENT

O. R. YOUNG, M. E., Editor.

Practical Electrictiy.

TROUBLES.

(Continued form June.)

Brushes making poor contacts.

Brush holder screws become loose and brushes get tipped up so that they touch only at one point. Very often the vaseline or oil has been applied with too liberal a hand and the commutator has become dirty. The springs which give tension to the brushes may have lost their temper from carrying the current, though this is an indication of faulty design of brush holder. The bearing parts may have been clogged for some reason so that the holder does not work freely though the spring may still be good. Hard carbons which will not adjust themselves in wearing to the commutator and which sometimes offer exceedingly high resistance, all these causes induce sparking at the commutator.

Copper brushes can be best filed for adjustment to the commutator in a jig made for the purpose.

The simplest and best way to adjust carbon brushes is to wrap a piece of sand paper about the commutator. Have the rough side of the paper turned out. Set the carbon brushes down tightly against this surface and revolve the armature by hand, the brushes will be rapidly and accurately shaped to the surface.

The best way to keep a commutator clean is to wipe it at intervals with a piece of cotton cloth or felt, slightly moistened in vaseline or oil.

Short circuited coils in armature and grounds.

A motor with short circuited coil or bad grounds will draw excessive current even though running free of load. A dynamo will require considerable power, though there is no evidence of current in external circuit, and will result in either case in violent sparking at the brushes.

The symptom most apparent will be a heating of the coil or coils affected and the attendant will probably be warned of the danger by the odor of burnt cotton insulation. This symptom will be referred to again later in the article under the head of heating of the various parts.

An armature coil short circuited is often the result of allowing copper dust to collect back of the commutator, or excessive sparking of the brushes has formed little bridges of metal across adjacent commutator segments.

Short circuits in parts of the coils of an armature frequently happen from injuries to the insulation of the wire from external mechanical sources, as for instance, the dropping of little particles of material in the spaces between the armature and pole-pieces, while the armature is in motion. A screw for instance or even little balls of waste and more frequently oil and dirt which cake on the faces of the

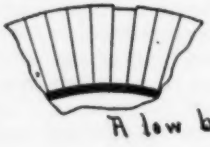


FIG. 5.

pole-pieces, scrape the insulation off the wire.

A piece of iron, a screw driver or key, for instance, held between the field magnet and near the revolving armature will vibrate very perceptibly as a short circuited coil passes.

In the case of a motor, an armature affected with a short circuited coil will revolve slower than usual and unsteadily and in aggravated cases will draw up with a jerk before the pole piece.

Troubles such as those ascribed to short circuits due to deposits of copper dust back of the commutator or the bridging over of segments from sparking may be located by careful inspection and may be removed by scraping clean the mica insulation between the segments with the point of a knife.

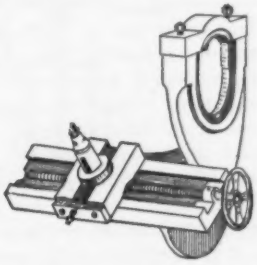
Short circuits due to mechanical injury to the insulation of the wire of the armature require careful handling. Such injuries generally extend below the first layer of wire.

In most cases it is possible to carefully lift one wire at a time high enough to wrap it with silk tape.

Wires thus raised and insulated must be carefully pounded back into place with wood block or mallet. The affected part is then treated with a coating of good shellac.

A short circuit which is in the coil itself and below the surface can not be treated thus and the only real remedy is to rewind the coil.

Two or more grounds in an armature, occurring usually from insufficient insulation on the core are equivalent to a short circuit and must be



A TOOL WHICH CLAMPS ON PILLOW-BLOCK AND IS USED TO TURN OFF COMMUTATORS.
FIG. 6.

treated in the same way, viz., by reinsulating and rewinding the armature.

Broken Circuits in Armatures.—

The commutator will flash violently when the broken coil passes under the brush and it will be found that the mica surrounding the segments attached to the broken coil will be blackened and burnt and gradually pecked away.

This break will often be found in the leads where the armature wires connect with the commutator as in some types of machine they are subject to heavy drag. Usually they can be easily repaired by splicing.

An overload may cause the soldered connection of the leads to the commutator to melt and thus to develop a break. The only available remedy is to solder in the leads again and guard against over load in the future.

Care must be exercised in the soldering process lest drops of molten solder drop down in behind the commutator and short circuit some of the segments.

Where the trouble can not be so easily located and is evidently in the interior of the coil. The coil thus affected will have to be rewound.

This trouble may be, however, temporarily remedied by cutting out the coil either by bridging over the disconnected segment with a drop of solder or by staggering the brushes as it is called, that is, by setting one of a pair a little ahead and the other a little back of their normal position. This being equivalent to bridging over the break.

In adopting this method, care must be taken not to short circuit a sound coil as this will according to a preceeding note of this paper, cause sparking and a dangerous heating of the affected coil.

These devices are at best only "make shifts" and should only be adopted to prevent a very undesirable stoppage.

Field troubles cause sparking at the brushes and are of two kinds, open circuits and short circuits.

A dynamo thus afflicted does not generate at all or does not come up to its full electromotive force. The pole pieces are not strongly magnetic.

A constant potential motor has a tendency to race unless indeed the field is very weak or is lacking altogether, in which case it may either run slow or stop and blow the fuse.

The cause for such trouble is usually a broken circuit or a partial short circuit in one or both of the fields.

In order to test for an open circuit in the field of a motor, block the brushes up from the commutator with

pieces of wood or paper, turn on the current, remove a field wire from its binding post and absence of spark at the breaking of the circuit will indicate a complete break somewhere in the circuit.

In cases of field trouble in isolated dynamos where current is not obtainable it will be necessary to remove the terminals of the field circuit from their binding post and ring through it with a magneto or bell and battery.

Short circuits in field coils may be determined by measuring with the proper instruments, usually a portable bridge and galvanometer, the resistance in each magnet coil. Any appreciable difference in the resistance of the magnets will indicate that the one of least resistance has been short circuited.

A machine thus affected will spark more at one brush than the other when running, and, further it will be noticed that the short circuited magnet will heat less than the sound one which in turn will be above the normal.

The remedy for such troubles is to remove the faulty magnet and unwind the wire on it, till the break or ground is found, when the fault may be repaired and wire wound back again.

It may be stated here that a frequent cause of short circuits in field magnets and armature is due to the soaking they receive from oil thrown out by faulty bearings.

Oil soaking into a field seems to have the effect of rotting the insulation on wire, and a short circuit or ground is the result.

Under this head we also include a number of minor causes for sparking at the brushes.

A carbon brush of high resistance may cause sparking because of its poor contact with the commutator.

A charring or burning of the brush about the edges will be noticed. The brush itself gets hot; in which case supply a softer brush.

Again, vibration in the machine due to insufficient foundation is frequently a cause of sparking. It will be found to decrease when the machine is braced. Sometimes nothing more is needed than a slight increase in the tension of the brushes. Better practice, however, is to secure the machine firmly to a good substantial foundation of masonry.

A chattering of the brushes is sometimes due to a dirty and sticky condition of the commutator. This is apt to be the case with radial carbon brushes. The remedy is to wipe the commutator clean and then to lubricate with a little oil or vaseline rubbed on with a piece of cotton cloth or felt.

A trouble to which the same armatures are liable, and which is sometimes very difficult to locate, is what is termed a flying break. It will develope after the armature is in motion and will cause violent sparking and every indication of an open circuit, but will not be apparent to tests made when the armature is stationary. It can usually be found by careful inspection of the leads and can be repaired with thoroughly good soldered joint.

Arrangement of Triple-Expansion Engines.

ROBERT GRIMSHAW.

The increasing use of triple-expansion engines, especially for modern purposes, renders it desirable to show the arrangement of their cylinders and the course of the steam therein.

To start out, there may be, in a triple-expansion or "three-stage expansion" engine, three, four, or any other number of cylinders, according to the notions of the designer or the necessities of the case.

A triple-expansion engine is not necessarily one with three cylinders, any more than one with three cylinders is necessarily a triple-expansion engine. But in what I have to say here we will assume that the three-stage expansion is effected in three cylinders. These may be arranged in several different ways with respect to one another.

The "tandem" arrangement, in which all their pistons have one piston-rod, is not practical for this type, as in the "two-stage expansion" or ordinary compound engine; and we have our choice between the "semi-tandem"

and the "cross" or "side-by-side" arrangement.

In the semi-tandem type, shown in figures 1 to 4 inclusive, the most usual way is to have the high-pressure and the intermediate cylinder axially in line, and the low-pressure cylinder beside the intermediate; the areas of these cylinders being so calculated that at the usual pressure and most common point of cut-off the work on

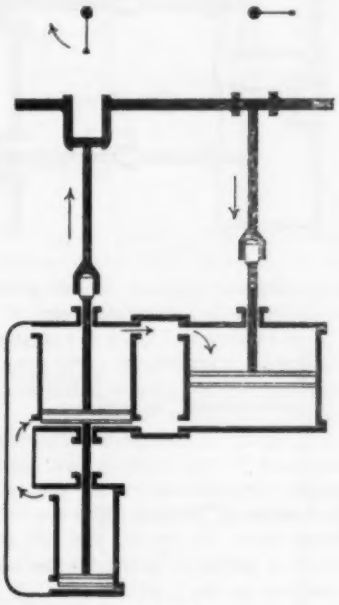


FIG. 1.

the two cranks shall be as nearly equal as possible. In Fig. 1 such an engine is seen just having completed the "out" stroke, that is, the one from the crank, and commencing the stroke towards the crank. The arrows show the steam course.

Referring to Fig. 1, and supposing that the high pressure cylinder has no "steam lead" of pre-admission, and that the stroke of the high-pressure cylinder is just commencing, we will have its exhaust passing into the first receiver and thence into the intermediate cylinder, and the exhaust from this passing into the low-pressure cylinders through the second receiver. The high-pressure and

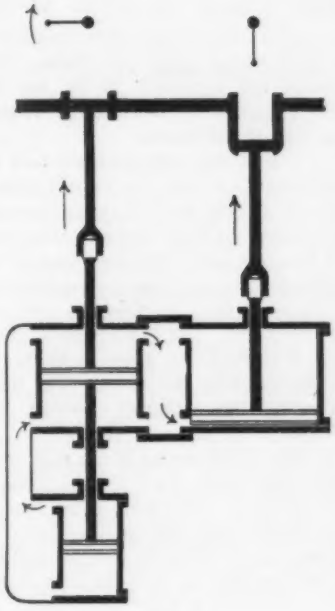


FIG. 2.

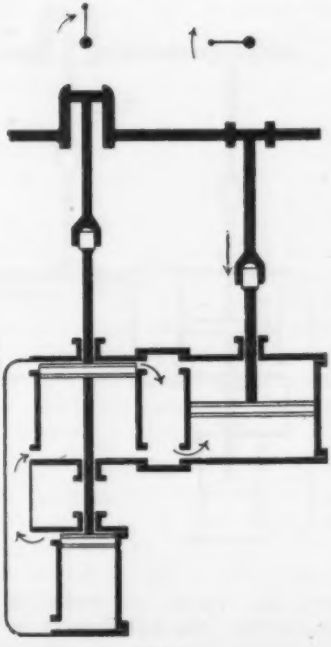


FIG. 3.

intermediate cylinders are just going to make the stroke towards the crank; the low-pressure cylinder is at mid stroke from the crank. The cranks are supposed to be set 90° apart, the low-pressure crank following that of the others.

In Fig. 2, the high-pressure and intermediate pistons are at mid-stroke, or, say a trifle past it, going towards the crank; the high is exhausting from its forward end to the back end of the intermediate; and the intermediate is exhausting from its forward end into the receiver. The low-pressure cylinder will then be about making its stroke towards the crank. The high-pressure has stopped getting live steam.

In Fig. 3, the stroke of the high-pressure and intermediate pistons towards the crank is supposed to be just at completion; the high-pressure still exhausting into the intermediate and the latter completing its exhaust into the

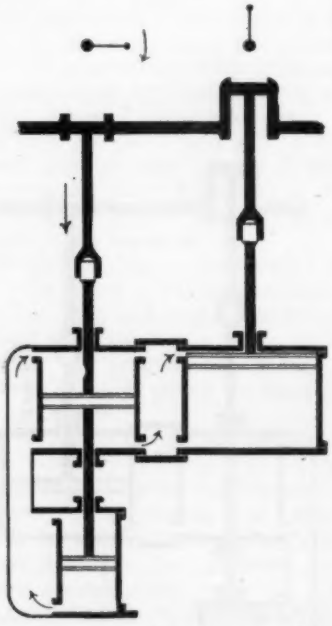


FIG. 4.

low, the piston of which is at mid stroke. The high-pressure is still not receiving live steam, although if there was steam lead it would be about time for it to get it.

In Fig. 4, the high-pressure and intermediate pistons are at mid stroke or a trifle past it; just enough for the

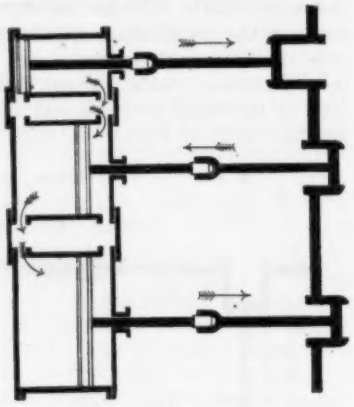


FIG. 5.

low-pressure cylinder to be getting steam from the second receiver.

Now turning to Figs. 5 to 8 inclusive we have a "three-throw" triple-expansion engine; the cylinder being side by side as in a "cross compound."

In Fig. 5 the high-pressure piston is supposed to be starting out on its stroke towards the crank; the intermediate is a little in advance of it, going from the crank, and the low-pressure piston is going in the same direction as the high.

In Fig. 6, the high-pressure piston is at mid-stroke, still traveling towards

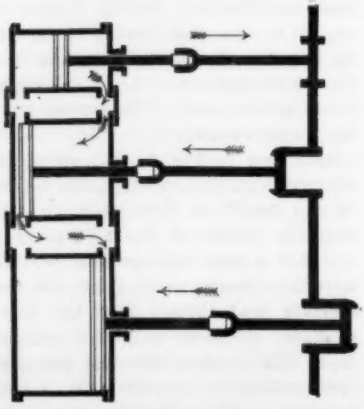


FIG. 6.

the crank; the intermediate is nearing stroke end (going upwards if it is a modern engine, while the high-pressure is going downwards) and the low-pressure piston has started on its upward trip.

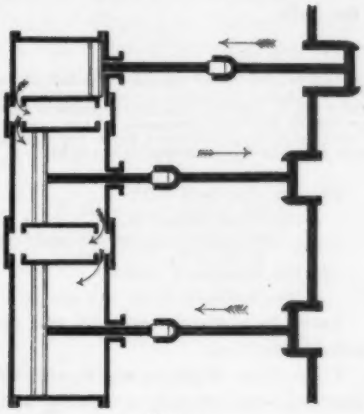


FIG. 7.

In Fig. 7 the high-pressure has completed its stroke towards the crank; the intermediate is on the way towards the crank and the low-pressure piston completing its stroke from the crank.

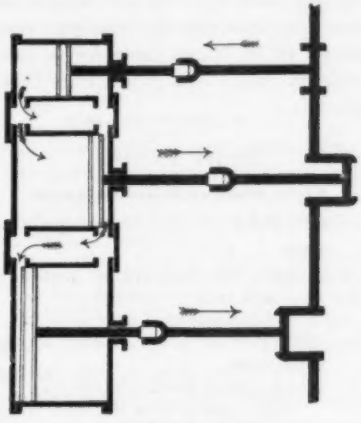


FIG. 8.

In figure 8 the high-pressure piston is about mid stroke, the intermediate very nearly at stroke end, going crankwards, and the low has just commenced its crankwards or downwards stroke. The cranks in this engine are set 120° apart, so that no one cylinder may be said to lead the others.

There may be, in a triple-expansion engine, two or more intermediate cylinders to one high-pressure; and also, two or more low-pressure cylinders.

—The occupier or manager of every textile factory shall post in every room where any employees work by the job, in legible writing or printing, and in sufficient numbers to be easily accessible to such employees, specifications of the character of each kind of work to be done by them, and the rate of compensation. Such specifications in the case of weaving rooms shall state the intended or maximum length or weight of a cut or piece, the count per inch of reed, and the number of picks per inch, and the price per cut or piece, or per pound; or, if payment is made per pick or per yard, the price per pick or per yard; and each warp shall bear a designating ticket or mark of indentification. In roving or spinning rooms the number of roving or yarn and the price per hank for each size of machine shall be stated; and each machine shall bear a ticket stating the number of the roving or yarn made upon it.—Mass. Statute.

—That Florence, at an early period, obtained a foremost position among the manufacturers of Northern Italy is proved by documents, which also attest the singular fact that in "A. D. 1259 the city of Florence had agents in England to purchase and forward the wools of that island to be manufactured in Italy; that the coarse, ill-grained, wrought fabrics from abroad were likewise imported, prepared, dyed, improved, and sold again at vast profits."

—Many rich Italian fabrics, dating from the close of the thirteenth and the beginning of the fourteenth centuries, can only be regarded as imitations of old or contemporary Saracenic models.

DYEING DEPARTMENT.

Dye Recipes for July.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16 page pamphlet, in convenient form for preservation. Subscription price for the TEXTILE WORLD with the Dyers' Supplement is $3.

RECIPE NO. 97.

Pink on Worsted Yarn.

Rouge de Lyon on 100 pounds worsted yarn.

Prepare dye bath with

6 oz. Rouge de Lyon A.

(Sykes & Street, 85 Water St., New York.)

Enter in yarn in cold bath, bring up to boil while turning, and turn 15 minutes at that heat.

The easy and simple method of dyeing the above shade will make Rouge de Lyon a very popular color. The shades produced are very rich and bloomy, and as they are fast to light and soap, also sulphuring, they should be looked upon with favor.

RECIPE NO. 98.

Drab on Cotton Yarn.

Cross Dye Drab on 100 pounds cotton yarn.

Prepare dye bath with

8 lbs. Cross Dye Drab.

(Read Holliday & Sons, Ltd., 100 William St., New York.)

40 lbs. Common Salt.

5 lbs. Soda Crystals.

Enter in yarn at 160° F., bring to boil while turning, and turn to shade at that heat.

Cross Dye Drab will be found a cheap as well as a fast color, dyeing very level shades, both light and dark. The cost of dyeing is very low. The bath can be retained for further use, with the addition of a less proportion of dye. (See recipe 85 in the June issue.)

RECIPE NO. 99.

Black on Cotton Flannel.

Pluto Black B on 100 pounds cotton flannel.

Prepare dye bath with

6 lbs. Pluto Black B.

(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)

20 lbs. Glauber's Salt.

5 lbs. Soda.

Enter in cloth at boil and run one hour at that heat.

Pluto Black B dyes a bluish and full shade of black on cotton. Being a direct dye, less is needed in succeeding baths, which will bring the cost of dyeing comparatively low, which places it within reach of all dyers of cotton blacks. This shade of black is fast to rubbing, and will combine with other benzo or direct dyes for shading. (See recipe 46 in March issue for a slate color on cotton knit-goods, from Pluto Black G.)

RECIPE NO. 100.

Light Blue on Worsted Yarn.

Reduced Indigo on 100 pounds worsted yarn.

First have the bath water heated to 122° F. Add to it

4 lbs. Reducteur.

For 100 gallons water. Add to the same bath.

3 to 4 quarts Reduced Indigo.

(The Jaeck Bros. Co., 62-68 North 11th St., Brooklyn, N. Y.)

Stir the bath up, allow to settle, then skim off the froth, and enter quickly, as much yarn as will comfortably lie in the bath. Sink the yarn and let it stay under the liquor for ten minutes, lift out, wring, let air, wash, and pass through a slightly acidulated bath.

Reduced Indigo, here shown, will be found very convenient to indigo dyers, on account of its easy method of application. This dye comes all prepared, and any ordinary dyer can manipulate

the bath. The bath can be made up as quickly as that of any other dye. To find if the bath is in right working order, add a few drops of the Reduced Indigo in one-half pint of the Reducteur bath, and if it shows up a green, the solution is all right. (See recipe 104, this issue.)

RECIPE NO. 101.

Yellow on Cotton Yarn.

Diphenyl Citronine G on 100 pounds cotton yarn.

Prepare dye bath with

1 lb. Diphenyl Citronine G.
(John J. Keller & Co., 104 Murray St., N. Y.)

20 lbs. Common Salt.

Enter in yarn at boil, and turn one hour at that heat.

Diphenyl Citronine G produces a fine pure shade of yellow, and will combine with other direct dyes in shading. The dye is easily dissolved, and works on the fibre slowly, giving level dyeings. (See recipe 106, this issue.)

RECIPE NO. 102.

Blue on Cotton Yarn.

Indol Blue on 100 pounds cotton yarn.

Mordant cotton in the usual way with Sumac and Tartar Emetic.

Wash off and dye in a bath with

1¼ lbs. Indol Blue R.
(New York & Boston Dyewood Co., 55 Beekman St., New York.)

2 lbs. Alum.

Enter in yarn luke warm; bring temperature slowly up to 185° while turning, and turn to shade at that heat.

Indol Blue produces fine indigo shades of blue, that are fast and will not run into white when woven together. This dye is fast to light and rubbing, and will combine readily with other basic dyes. It works on the yarn very evenly, and the cost of dyeing is moderate.

RECIPE NO. 103.

Orange on Cotton Flannel.

Klondike Yellow and Orange on 100 pounds cotton flannel.

Prepare dye bath with

1¼ lbs. Klondike Yellow G G.

1¼ lbs. Klondike Orange R R.
(The Hanna-Schoellkopf Co., 135 No. Water St., Philadelphia.)

25 lbs. Common Salt.

Enter in cloth at 170°; bring to boil while turning, and turn one hour at that heat.

The combination here shown works well on cloth or yarn, lifting the dyes equally on the fibre, which insures even and level dyeing. The Klondike series of colors combine well together, and with other direct dyes, and can be worked to advantage on all goods. (See recipes 81 and 93, showing the effect of these dyes used alone.)

RECIPE NO. 104.

Dark Indigo Blue on Worsted Yarn.

Reduced Indigo on 100 pounds worsted yarn.

Have bath water of 100 gallons at a temperature of 122° F.; add to it

8 lbs. Reducteur.

Stir up and add to the same bath

10 quarts Reduced Indigo.
(The Jaeck Bros. Co., 62-68 North 11th St., Brooklyn, N. Y.)

Stir; allow to settle; skim off froth; and add enough yarn to comfortably lie in the bath; give one turn; let lie under the bath for 10 or 15 minutes; lift out; wring; let air, and repeat the operation. After airing, pass through a slightly acidulated bath. The more dippings the darker the shade will be. By giving the yarn one or more dippings the shade becomes darker, as it oxidizes when exposed to the air; and by keeping the yarn under the bath each time it is entered, the dyer can judge of the number of dippings needed to produce any required shade. (See recipe 100, this issue.)

RECIPE NO. 105.

Light Brown on Coarse Worsted.

Chrome Brown R O on 100 pounds worsted yarn.

Prepare dye bath with

1 lb. Chrome Brown R O.
(Victor Koechl & Co., 122 Hudson St., New York.)

10 lbs. Glauber's Salt.

3 lbs. Sulphuric Acid.

Enter in yarn at 120°; bring to boil

while turning, and turn one hour at that heat, then add to bath

2½ lbs. Bichromate of Potash

and turn at boil for three-quarters of an hour.

Chrome Brown R O is an exceedingly fast color, producing a variety of brown shades. The developing with Bichromate of Potash makes it an extra fast color, and can be applied on piece goods or raw stock to equal advantage.

RECIPE NO. 106.

Yellow on Cotton Yarn.

Diphenyl Citronine on 100 pounds cotton yarn.

Prepare dye bath with

2 lbs. Diphenyl Citronine G.
(John J. Keller & Co., 104 Murray St., New York.)
20 lbs. Common Salt.

Enter in yarn at boil, and turn one hour at that heat.

Owing to the fine shades of dark and light yellows produced with Diphenyl Citronine G, it will be very useful in itself and for combining with other direct dyes. It lifts on the color evenly, and the cost of dyeing is small. (See recipe 101, this issue).

RECIPE NO. 107.

Wine Color on Coarse Worsted Yarn.

Prepare dye bath with

3 lbs. Enophine Crimson.
4 lbs. Sulphuric Acid.
(Anchor Color Mfg. Co., 462 Cherry St, New York.)
10 lbs. Glauber's Salt.

Enter in yarn at 120° F.; bring to boil while turning, and turn to shade at that heat.

Enophine produces a full, bluish shade of crimson. The dye goes on slowly and dyes perfectly level shades on the fibre. It will combine with similar acid dyes. It is fast and will not rub off.

RECIPE NO. 108.

Very Dark Olive Green on Coarse Worsted Yarn.

Fustic Liquor M on 100 pounds worsted yarn.

Mordant for 1½ hours at boil, with

3 lbs. Bichromate of potash.
2 lbs. Tartar.

Wash and dye in a bath with

10 lbs. Extract Fustic Liquor M.
(Stamford Mfg. Co., 133 Front St., New York.)
8 lbs. Alizarine G B.
3 lbs. Acetic Acid.

Enter in yarn at 160° F.; bring to boil while turning, and turn to shade at that heat.

For combining with alizarines, and other similar dyes, Fustic Liquor M will be found of great value, on account of its pureness and brilliancy. It produces in itself, a very fine shade of golden yellow. (See recipe 76, showing Alizarine Blue G B, in combination with Logwood N, and recipe 83, showing another combination of this Alizarine with Fustic Liquor N.)

RECIPE NO. 109.

Red on Cotton Flannel.

Acridine Orange G and Rhodamine 3 G on 100 pounds cotton flannel.

Mordant in the usual way with Tannic Acid and Tartar Emetic, and dye in a bath with

1½ oz. New Acridine Orange G.
4½ oz. Rhodamine 3 G,
(C. Bischoff & Co., 87 Park Place, New York.)

Enter in cloth at 90° F. Bring temperature up to 120°, and turn to shade at that heat,

The above two dyes combine well together, and by varying the proportions, some very fine shades can be produced.

RECIPE NO. 110.

Blue on Coarse Worsted Yarn.

Alizarine Lanacyl Navy Blue B on 100 pounds wool yarn.

Prepare dye bath with

2 lbs. Alizarine Lanacyl Navy Blue B
(Wm. J. Matheson, & Co, 182 Front St., New York.)
10 lbs. Glauber's Salt.
5 lbs. Acetic Acid.

Enter in yarn at 120° F; bring to boil while turning, and turn one hour at that heat, then add

5 lbs. Acetic Acid

and turn 20 minutes more at boil.

Alizarine Lanacyl Navy Blue B dyes a very fast shade of blue, and, on account of its being a one-dip dye, it will be of great value to many dyers. It does not bleed or rub off, and for dyeing piece goods, it will be found well adapted on account of its going on the fibre slowly and level. (See recipes 51 and 56, for effect of Alizarine Lanacyl Blue 3 B, and of Violet B.)

RECIPE NO. 111.

Light Brown on Cotton Yarn.

Direct Brown 5095 on 100 pounds cotton yarn.

Prepare dye bath with

1 lb. Direct Brown 5095.
(The Stone & Ware Co., 157 Maiden Lane, N. Y.)
15 lbs. Common Salt.

Enter in yarn at boil and turn to shade at that heat.

Direct Brown dyes very fine cutch shades, and can be relied upon to give level results. The shades, whether light or dark, are very fast, and by combining the above dye with Direct Navy Blue, as shown in recipe 61, dark shades can be produced with very little cost. (See recipe 39, showing this dye on cotton knit-goods.)

RECIPE NO. 112.

Blue on Silk Goods.

Glacier Blue on 100 pounds silk piece goods.

Run one hour at 190° F. in a broken soap bath, with the addition of

12 oz. Glacier Blue.
(A. Klipstein & Co., 122 Pearl St., New York.)

Glacier Blue produces fine greenish shades of blue on silk and wool. It being such a clear color, dyers of silk and wool can produce any shade of blue they may want, by combining it with other colors. It is fast and dyes level on the fibre. (See recipe 82 for a light blue on worsted yarn.)

New Dyes.

We give in this issue a number of recipes containing dyes that have not heretofore appeared in our Supplement.

Recipe 97 furnishes an excellent method for obtaining a pink on worsted yarn, from Rouge de Lyon A, furnished by Sykes & Street, New York. This dye is used on wool in a neutral bath, that is, without the adtion of any mordant. The bath is not thoroughly exhausted, and is usually retained for future use. The color produced is very fast to light, air and strong soap, and fairly fast to sulphuring, making it of special interest for blanket headings and similar work.

Particular attention is called to recipes 100 and 104, showing the use of Reduced Indigo, furnished by The Jaeck Bros. Co., of Brooklyn, in the production of a wide range of blue shades, from a light to a very dark, on worsted yarn. Our dyer's comments will be read with undoubted interest on the part of dyers.

John J Keller & Co., New York, furnish their Diphenyl Citronine G in recipes 101 and 106, for the production of two shades of yellow on cotton yarn. This dye is adapted for dyeing cotton yarn, raw stock and piece goods, also for union goods. The color is fast to light, washing, chloride of lime, acid, alkali and hot pressing, and being soluble is consequently a very useful article.

Recipe 102 shows a blue on cotton yarn, obtained from the use of Indol Blue R, furnished by the New York & Boston Dyewood Co., New York. This dye has been recently introduced as a basic coloring matter, which, on account of its excellent properties deserves to be mentioned among the best of indigo substantives for cotton and linen dyeing. The method of its use may be noticed in the recipe. On cotton and linen, this dye yields brilliant, full indigo shades as regards fastness to washing, this dye is similar to indigo. The color is fast to acids and very fast against light. It will serve as well for bottoming as for topping indigo, and is very well suited for topping substantive cotton dyeing direct, this being especially valuable for dyeing linen, on account of its penetrating the fibre well. The dye

possesses excellent qualities for coloring jute and silk.

We think dyers will be much pleased with the results obtained from the use of Chrome Brown R O, furnished by Victor Koechl & Co., New York, as seen in recipe 105 for obtaining a light brown on coarse worsted. We direct attention to our dyer's comments.

An excellent wine color on coarse worsted yarn is seen in recipe 107, obtained from Enophine Crimson, furnished by the Anchor Color Manufacturing Co., New York. This dye is adapted for plush goods as well as wool or yarn, and is a very fast color. It has met with favor wherever it has been used in the dyehouse. Many excellent shades can be obtained from its use in connection with Cocanine B, furnished by the same house.

Synthetic Indigo.

The Textile Manufacturer of Manchester, England, in one of its late issues calls the attention of its readers to the new and formidable competitor against natural indigo that has arisen in the synthetical indigo brought last summer into the market by the Badische Anilin and Soda Fabrik.

Now, in dyeing, as well as in every other branch of commerce and science, progress is inevitable. Though a thing may be good, still it always must succumb in the struggle with something better. Whenever a new product is brought into the market the color-makers issue directions for its application and give full particulars as to its properties, in order to acquaint the user with its nature. These directions are intended to give the dyer a hint as to what he may expect. Of course, it must be left to practical men to adapt them to their particular requirements for which they are wanted for the time being. This point is one of the chief tasks of the practical dyer, and is not less important than the exact matching of shades. The color-makers know just as well as the dyers that if worked under different conditions after the same method, different results will and must arise.

As already mentioned, the indigo pure (Synthetic Indigo) of the Badische Anilin and Soda Fabrik is nothing else but indigo, which is the same blue coloring matter as contained in natural indigo. Its properties are therefore identical in every respect with those of the latter.

Wool, as well as cotton and silk, can be dyed with it in any vat used for indigo, and it cannot be detected even by analysis whether the natural or the artificially made indigo has been used. It consequently would be to the dyer a question of price only which of the two to employ, did not the artificial indigo possess other advantages overbalancing the natural. It is a well known fact that natural indigo varies in strength and purity, and that the price, owing to the good or bad crops, is subject to great fluctuations. These fluctuations make it a difficult matter for the dyer to choose the most favorable moment for buying, and the varying, changing quality of the indigo often curtails the possibility of making the right selection in the quality.

The synthetic indigo, on the other hand, is delivered in a uniform quality of a standard strength. Fluctuations, such as occur with the natural indigo, are therefore excluded. The paste has, besides, the advantage that it is sold in the ground state, thus saving grinding and being always ready for use. Different kinds of natural indigo are in the market; for instance, Java, containing from 70 to 80 per cent. indigotine; Bengal testing 60 to 70 per cent; Kurpah, from 30 to 55 per cent. and even qualities below 30 per cent.

In the face of such differences, it is extremely difficult, and in fact almost impossible, to judge the exact coloring strength by appearance of the article or by breaking it. In analyzing, it has been found that lots sold as one quality of indigo vary in themselves, and even samples drawn from the same chest have been proved to differ as much as 7 to 8 per cent. in indigotine, though by appearance it was scarcely distinguishable. Chemical

analysis, therefore, when buying natural indigo, is only of value if one is quite certain that the sample represents the average bulk. Furthermore, it should be borne in mind that the methods of indigo analysis adopted in practice do not always give reliable results.

For some time indigotine has been extracted from natural indigo, and this product brought into the market under the name of refined indigo. Of course it is also subject to the same fluctuations in price as natural indigo itself. Efforts have also been made in India and other countries to obtain a more uniform quality in the manufacture, but it appears that the experiments have not been successful, for the qualities which are sold in the market still differ just as much as ever.

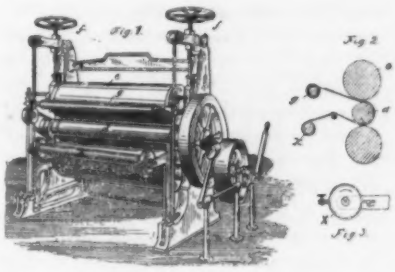
The dyer who lays stress upon the purity of shade of the indigo has the certainty, when using the artificial indigo, that he is using the purest quality which can be commercially obtained, especially the pure indigo of the Badische Anilin and Soda Fabrik.

Summing up, the dyer has, when using pure indigo, a uniform quality, which, as a paste, is ready for use, and can also compete in price with the best obtained from the indigo plant. He does not therefore run the risk of a wrong speculation in buying and knows exactly what he is buying. He need not wait for the moment which he considers best for making his purchases, and he can obtain the indigo pure in any quantity, from the smallest to the largest, at any time, according to his requirements. We need not go into details as regards the dyeing of indigo pure, there being no difference from natural indigo in this respect. For dyeing and printing cotton and silk, indigo pure, of course, can be used exactly the same as natural.

Cotton piece dyers will be interested in the new process, according to which the cotton cloth is prepared before dyeing with a solution of glue of similar substances in order to obtain fuller shades of particular beauty and fastness.

Mercerization.

An unusually long interval has elapsed between the application by Thomas & Prevost, of Crefield, for their latest English patent and its acceptance. The complete specification was lodged on April 14th, 1897, and it was accepted on April 14th, 1898. The firm now claim to have discovered that a higher degree of gloss may be obtained if the goods are submitted to pressure during the washing out, or at any rate before drying. Any method may be employed to produce the stretched condition. It is, however, sufficient if the shrinking is prevented either wholly or in part whilst it is undergoing Mercer's treatment by winding it firmly upon cops, bobbins, spools, drums, or rollers. As the



fibre has a strong tendency to shrink whilst it is undergoing Mercer's treatment, and as this is opposed in this way a powerful internal tension must be set up in this case also. That is to say, directly the tendency of the fibre or fabric to shrink is opposed to a greater or less extent by mechanical means a condition of tension is always produced, or the already shrunk fibre or fabric may be stretched. If pressure is employed before the drying, the gloss so obtained is completely unaffected by washing and is scarcely diminished even by a lengthy boiling. If the pressure is employed after the drying has taken place it is true that an increased gloss may still be obtained, but this is not fast and disappears upon the material being made wet. The pressure may be exerted either in places only, by the use of

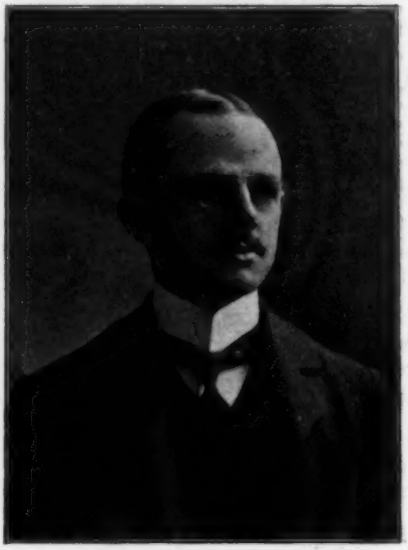
profiled or shaped pressure cylinders, for example, or upon the whole surface, according as it is desired to obtain either separate glossy parts or patterns or an entirely glossy material. In practically carrying out this invention the fibre or fabric is submitted to simultaneous stretching and strong pressing action whilst it is undergoing Mercer's treatment, or washing out by any suitable means such as calenders, beating or beetling mechanism, or rollers. An almost equally high degree of gloss may be produced when the pressure is exerted after the removal of the lye, and even after the acid has been removed from the fibre which has been treated by Mercer's process, as the fibre becomes so soft and impressionable during the process that it is highly susceptible to pressure. The above discovery, say the inventors, gives rise to the supposition that the silky gloss produced by the treatment of cotton in a stretched condition by Mercer's process is also attributable to the internal pressure produced by the tension of the fibre and therefore that it is fast or unaffected by washing only because it is at once fixed by the pressing action whilst Mercer's treatment is taking place, owing to the special qualities of the fibre.

Fig. 1 is a view in elevation of the apparatus for this process; Fig. 2 is a diagram showing the course taken by the goods in passing through; Fig. 3 is the tension regulation device.

The mercerized goods are wound off the roller "x," pass downward around the roller "d" between the rollers "d" and "e," and then pass to the roller "g" upon which they are wound. Upon each side of the roller "x" a brake disc is arranged, by the agency of which the tension of the goods is attained. The pressure on the goods is effected between the rollers "d" and "e" by the downward pressure of the roller "e" obtained by means of the hand wheels "f." The manner of driving the rollers "d" and "e" and "g" can be clearly seen from the drawing.

Harry Harding Bosworth.

We give, herewith, a portrait of Harry H. Bosworth, who was awarded the Textile World's gold medal, as a member of the graduating class of the Textile School connected with the Pennsylvania Museum and School of Industrial Art, Philadelphia, at the commencement exercises that were held at that institution June 9, 1898, for the best results in final examinations and term work in dyeing. Mr. Bosworth is a native of Massachusetts, twenty-one years of age, but has lived most of his time in Minneapolis,



HARRY H. BOSWORTH.

Minn., receiving his school education at that place. He went to the textile school to prepare himself for the commercial part of the textile business, and has completed there a two years' course of study.

—The making a blend that will spin to 20's and 22's count in carded woolens is not a task for a tyro, if it shall be fit to stand the strain of a power loom.

QUESTIONS AND ANSWERS.

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

An Indigo Color.

Editor Textile World:

Will you please give me a good recipe for obtaining a light and dark shade of navy blue on worsted yarn?

Tennessee. W. F. G.

We would suggest that our advertisers be written to, as we are certain that some of them can furnish valuable recipes for producing this color in a number of shades. We shall represent in our July Dyers' Supplement, samples of worsted yarn that we should think would answer the purposes of this inquiry.

Linen Toweling.

Editor Textile World:

Can you tell me what mill in this country manufactures linen toweling, and also the amount of such goods imported?

Penn. S. H. H.

The Stevens Linen Works, Webster, Mass., make such goods. The product of these works is sold by Nevins & Co., New York and Boston. There are no separate statistics showing the amount of importation of these goods. They are included under the general term of manufactures of flax.

Braiding Machines.

Editor Textile World:

Kindly advise us if you know of any firm in the State of New Jersey that makes braiding machines. We are in the market for some and believe there is a machine made there, but have forgotten the name? C. B. A.

We do not remember any firm in the state of New Jersey that makes braiding machines. The firm of Thun & Jansen, Reading, Penn., build braiding machines, and it is probable that this is the firm that you have in mind, and we would suggest your writing to them.

The Round Cotton Bale.

Editor Textile World:

Can you tell me whether the cylindrical cotton bale meets with favor among the cotton brokers of New York?

Alabama. G. C. H.

In a recent letter from the secretary of the New York Cotton Exchange, this bale was incidentally alluded to, in connection with the fact that bales of cylindrical form do not constitute a good delivery on a future contract, to the effect that it is well received by this fraternity, as keeping the cotton in good condition, because of its covering.

Cost and Weight of Cotton.

Editor Textile World:

Will you kindly inform me what was the cost per pound of cotton, and what was the average weight per bale during the year of 1897? I assume that the weight varies in different years.

Connecticut. S. B. H.

We understand by this query in regard to the cost, that it refers to the market value of cotton. Taking midling upland cotton as a standard upon which prices are based, we will say that for the season of 1896-97, the highest price was 8 7-8 cents, and the lowest 7 cents per pound, and for the calendar year of 1897, the highest was 8 1-16 cents per pound, and the lowest 5 3-4 cents. The average weight of the bales for the season of 1896-97 was 502 pounds gross.

Low Cost Goods for Pants.

Editor Textile World:

Will you give us the names of parties who manufacture cotton-worsted, cassimere and cheviot pants goods, at or below 25 cents per yard?

Georgia. R. M. L.

If there is anyone making goods at this low cost, we should say that they could be found with James Talcott, 108 Franklin St., New York.

Army Goods.

Editor Textile World:

I have been told that the same specifications are sent out by the army and navy departments, for fabrics for clothing for the soldiers and seamen, as during the Mexican and Civil wars. Is my information correct?

Rhode Island. W. S. P.

We put this question to the quartermaster of the United States army, and he replies that "the purchases of clothing during the Mexican and Civil wars were made according to standard samples, and

not upon specifications, as has been the case of recent years.

Classification of Middling Cotton.

Editor Textile World:

Has there been any change in the classification of middling upland cotton within the last fifty years?

Massachusetts. H. H.

We have submitted this inquiry to some of the oldest cotton merchants in New York, and, upon their statement, we should say that there has been no material changes in the classifications of this standard grade of cotton within the period named. Walter T. Miller, New York, who has been in the cotton trade for more than fifty years, writes that the classification in the New York market, of this grade, has hardly been changed at all for the last fifty years. Mr. Miller writes thus: "We are not subjected to the influences that other markets are. Early in each season the crop is good, and middling is likely to be scarce. The tendency is to make the grade slightly better at that time until the later pickings appear, when the middling deliveries are lower in grade. The Continental classification is tolerably regular. In Liverpool, the grade of middling always was below New York. Their low middling, and grades below, are better than ours, and they always were. For all statistical purposes the valuations of middling in all markets are near enough correct. For other purposes, the observations above noted may be taken into consideration."

Fur Bands.

Editor Textile World:

Will you please send me the address of some dealer in fur bands, suitable for slippers and woolen mitts, about three-quarters or one inch wide.

Texas. G. S.

We think fur bands can be obtained of most any furrier, but we would give the address of Lehburger & Asher, 46 Chauncy St., Boston, Mass., who can probably furnish the needed article.

Printed Silk Fabric.

Editor Textile World:

Enclosed find two pieces of printed silk fabric. Can you inform me if the white sample can be printed the same as the striped one, and where can I get a piece of twenty yards printed. The white fabric, I have an idea, might be dyed one color, say for instance yellow, and the black printed on it.

New York. G. H.

The samples sent are knitted. The colored one had the yarn dyed in the skein and so woven. We doubt very much if the white fabric can be printed, on account of its great elasticity. However we have given our correspondent the name of a concern that will be able to do the work, if anybody.

Silk Heel and Toe.

Editor Textile World:

In answer to a question in our June issue, referring to hosiery with silk heel and toe, we spoke of this being knit on a double ribbed machine. It was a slip; we intended to say a two feed ribber.

Waste on Cotton.

Editor Textile World:

Can you give me the percentage of waste of middling and strict-good middling cotton, through one opener and three pickers; also total percentage of waste on yarn spun from that cotton. I should also like to know whether it is better to dye the cotton for ginghams in the raw state, or in the chain.

Mass. A. R.

We have no data to furnish our correspondent an exact answer to his questions. We have an estimate at hand of the waste that was made in passing an invoice of cotton weighing 100,320 pounds through the several processes of picking and carding. The actual loss was as follows: Sacking, 2950 pounds; hoops, 1845 pounds; cotton seed, 1174 pounds; fan waste, 995 pounds; card strippings, 2165 pounds; oily card, 388 pounds; floor waste, 318 pounds; batting, 971 pounds; total, 10,806 pounds.

This shows a loss of about ten per cent. We will explain that this cotton was put through double carding and doubled through railway heads, two sets of drawing, and three processes of roving machines. We think that possibly there might be economy in the waste account by the use of revolving flat cards. In regard to dyeing yarn for ginghams, we should say that the best method would be to color in the chain.

Duck Cloth.

Editor Textile World:

We enclose herewith a small sample of duck, 64x80. We suppose that the warp is drawn into the harnesses, two in front and two in back, and then repeated. What we would like to know is how the double filling is twisted before it is woven. After thread is spun on a ring frame what is the next thing to be done to get the thread double and twisted?

Georgia. J. J. B.

The filling for the piece of goods sent us can be made in two ways; either on a twister or on a quiller. Should a quiller

be used, run the yarn two ends into one which will give it a very slight twist, and, at the same time, put it on a bobbin that will enable it to weave off. Your idea of the arrangement of the warp threads in the harnesses is all right, although it can be done on two harnesses. The cloth is two picks, single yarn, in a shed. This can be done with cams or with Dobbie heads.

Cellulose for Manufacturing Fabrics.

Editor Textile World:

On page 22 of your June issue, I notice an article on coating fabrics with nitro-cellulose, and mention is made of a patent for improvements in the art of coating with this compound. Can you tell me where I can get the specifications of this patent?

R. I. E. T.

The patent refers to coating fabrics of permeable materials with nitro-cellulose compound and products produced thereby, and is the invention of an Englishman, who has taken out letters patent in this country, No. 602,797, which will furnish all the necessary information.

Peruvian Cotton.

Editor Textile World:

Can you give me any information about Peruvian Cotton, as we are about to try some at this mill, and would like to get posted a little in advance. I would like to know the length and nature of the staple, and if it is for fine or coarse numbers, and the kind of goods it is mostly used for, and the "twist constant," for hosiery yarn.

Conn. W. A. R.

Most of the Peruvian cotton imported is known as rough Peruvian, and is largely used in our woolen mills, mixed with wool, as it resembles that staple very considerably. There are mills however in this country that use this cotton alone, such as is the case with some of the Fall River mills and others. The staple of this cotton is strong, and will average, we should say, 1 3-8 inches. This cotton does not compete in the least degree with American cotton. In regard to a "twist constant," for this cotton, we do not think it is possible to get a correct one, as the cotton varies in staple and fineness so much. One has to be governed entirely by his judgment in putting in the required twist. We have given the name of a party to our correspondent who will furnish him with valuable information concerning his inquiries.

East Indian Monsoons.

Editor Textile World:

When do the South Western monsoons in East India begin?

Pennsylvania. J. B.

Taking the last 26 years, we note that this monsoon begins at different times, in the months of May and June. The earliest date within this period at which this monsoon appeared was May 26, and the latest date was June 21.

Dress Goods Wanted.

Editor Textile World:

Can you furnish me with a list of mills that make dress goods, and would be likely to have machinery on hand to weave 54 to 56-inch piece dyed serges, goods to weigh 8 to 10 ounces?

Penn. N. S. C.

At the present moment, we do not think of any mill that has machinery wide enough for such goods, except the Arlington Mills, Lawrence, Mass. If there are any other mills that can make these goods, we should be pleased to hear from them.

The Revenue Tax.

Editor Textile World:

Will you please inform me what the stamp tax is to be on bank checks, bonds and telegraph dispatches?

New Hampshire. —J. C. A.

The stamp tax, which went into effect July 1, on bonds, debentures, or certificates of stock and indebtedness issued after July 1, 1898, on each $100 of face value, 5 cents; bank check, draft or certificate of deposit drawing interest, or money order at sight, 2 cents; telegraphic dispatch, 1 cent.

Thread Combination.

Editor Textile World:

What is the name of the new company that includes the Willimantic Co. with others? I refer to the new consolidation of thread mills. —W. C.

Mass.

The name of this company is The American Thread Company Consolidation, and will include, besides the Willimantic Co., the Merrick Thread Co., of Holyoke, Mass.; the William Clark Co., of Westerly, R. I.; the Glasgow Thread Co., of Worcester, Mass.; the Kerr Thread Co., of Fall River, Mass.; the Hadley Thread Co., of Holyoke, Mass., and the Barstow Thread Co., of Providence, R. I. The new company is to be capitalized at $18,000,000. About half the new securities will be held in England and the other half in America.

Placing Engine on Dead Centre.

Editor Textile World:

Will you please explain how to place an engine on the dead center?

Chicago, Ill. C. B.

Turn the engine toward the desired center until the crosshead has approached to within two or three inches of the end of its travel, and make a mark on the guide corresponding to the edge of the crosshead; also make fast temporarily a tram or pointer with its point close to the rim of the fly wheel and place a chalk mark on the wheel to coincide with this pointer.

Turn the engine past the center until the edge of the crosshead and the mark on the guide come exactly in line again. Make another mark on the rim of the fly wheel at the pointer.

Now divide the distance on the fly wheel between the two marks equally, and place the new mark where it exactly meets the pointer and the crank will be on the center.

New Publications.

Bulletin of The National Association of Wool Manufacturers, for June, 1898, has just been issued by the Association, S. N. D. North, secretary. This quarterly magazine is the only recognized official organ of the wool manufacturers of the United States. The first article in this number is entitled the "Development of the American Export Trade," contributed by Secretary North, and is devoted to such considerations as the fruit of protection; the duties on raw materials; Imports and Exports of textile manufactures; and the position occupied by the Philadelphia Commercial Museums, in their relation to our commerce. Subscription price $2 a year; single copies, 50 cents.

Yale Review, for May. New Haven, Conn.; Tuttle, Morehouse & Taylor. This number of the quarterly journal for the scientific discussion of economic, political and social questions, published under the supervision of professors of Yale University, New Haven, Conn., has just appeared, with the following articles: The Cuban Revolt and the Constitution: Ancient and Modern Hindu Gilds; Bank Clearings, Interest Rates and Politics; Two Plans for Currency Reform; The Concentration of Industry in the United States.

Cotton Spinning, by William Whittam, Jr. Providence, R. I.: C. A. M. Praray & Co. This is a book of 75 pages, being the second edition, revised and enlarged, of Mr. Whittam's book on Cotton Spinning that was primarily published in 1889, and intended for the use of students of cotton spinning, to aid them in their preparation for the examinations in this subject held by the City and Guilds of London. The questions set at the May examination of 1889, with answers, make up the contents of this book. This work has always been regarded as helpful to the students in cotton manufacturing.

Industrial Supremacy. This is the title of a pamphlet of an address delivered at the annual commencement of the Pennsylvania Museum and School of Industrial Art, Philadelphia, June 9, 1898, by Alfred Clarke, secretary of the Home Market Club, Boston.

Summer Resorts and Tours. The Boston & Maine R. R. has issued a series of pamphlets, with numerous illustrations and maps, showing places of interest to those seeking pleasant places of resort during the summer months in the Monadnock Mountain region, Lake Memphremagog and vicinity, and other places throughout New Hampshire and Maine.

Appleton's Popular Science Monthly, for July. New York: D. Appleton & Co. Price $5 per year. The first article in this number is an extremely interesting one of a series, entitled "The Evolution of Colonies," which is especially timely, due to the possibility of the United States soon embarking in a system of colonial extension. A copiously illustrated article also appears in this number, on "The Methods and Instruments Used in the United States Weather Bureau." An article on "Bird Life," with numerous illustrations also appears in this issue. A second article of the series on "Philosophy of Manual Training" appears, describing the methods of this important branch of education.

Anthracine Acid Colors. Wm. J. Matheson & Co., New York, have just issued a pattern card showing colors obtained from this dye, the principal advantage of which for dyeing fast shades on wool consists in being adapted for dyeing on a chrome bottom as well as a single bath.

Tannin Orange R and New Phosphine G. This is the title of a color pamphlet issued by Wm. J. Matheson & Co., New York, for the purpose of showing certain self shades obtained from these dyes in combination with other basic colors printed and discharged on white and on a bottom dyed with diamine colors.

Naphtylaminschwarz S and other dyes are represented in a color pattern card issued by Wm. J. Matheson & Co., New York, which dyers will find to their interest to write for.

Diamine Colors on Mercerized Cotton Linings. Wm. J. Matheson & Co., New York, have just issued a color card under the above heading. Different methods are given for dyeing mercerized cotton linings, because cotton thus treated takes up dyestuff quicker than goods unmercerized. Dyers interested in such products would do well to write to this concern for the color card.

Rope Transmission. Chicago, Ill.: H. Channon Co. A treatise on this subject has recently been issued by H. Channon & Co., dealers in rope for transmission of power, Chicago, Ill. In issuing this pamphlet, the company calls attention to the fact that for many years they have been selling large quantities of rope for transmission of power, which they have branded as the "Ajax." This rope is made of only the longest and best manila fibre that is produced, and laid up in a lubricant of the company's own preparation. Aside from the advertising character of the treatise, it contains valuable matter well worth the reading by any mill engineer. The treatise will be sent, no doubt, upon application to the company.

Davidson Fan Wheel. The Massachusetts Fan Co., whose main office is at 641 Exchange Building, 53 State Street, Boston, Mass., has issued an attractive new catalogue under the foregoing heading, illustrating its fans. This company are ventilating engineers, contractors and builders of the Davidson ventilating fan wheels and other forms of ventilating apparatus for use in mills, schoolhouses, public buildings and for general ventilation. The form of the blade, in this fan is claimed to be one of its most valuable features, and to be so constructed that, in revolving, it cuts through the greatest amount of air, and carries its load equally along the whole working surface, and thus avoids carrying the greatest weight at the periphery. It is claimed that a uniform delivery is thus obtained over the whole surface of discharge, without reflex action or back lash. The blades are made from the best quality of mild flange steel, of extra weight, properly formed on moulds, thus insuring uniformity in all particulars. The blades are carefully riveted to a heavy wrought iron ring encircling the blade ends, also to Norway iron clips, which, in turn, ar threaded and screwed into the cast iron hub. The boxes are of the self-oiling type, with babbitted journal bearings. The oil from a reservoir below, is conveyed to the shaft by wicking, affording ample lubrication. The babbitted portion of the box is removable, and can be replaced at a small cost. The company will build, if so requested, their fans wit ball and socket boxes, on either or both ends of the fan, with removable graphite and bronze bushings, without extra charge. The catalogue will be sent to anyone writing for it.

Industrial News.

—The Howard & Bullough American Machine Co., Pawtucket, R. I., have received another order for revolving flat cards supplied with the new top flat grinding arrangement and improved doffer slow motion, from the May's Landing Water Power Co., May's Landing, N. J. They have also received the entire order for machinery, including picking machinery, revolving flat cards, electric stop motion, drawing frames, slubbing, intermediate and roving frames, and improved new pattern spinning frames, from the Kinston Cotton Mills, Kinston, N. C. They have also received a repeat order for roving frames and spinning frames from the Sycamore Mills, Sycamore, Ala.

The W. A. Jones Foundry and Machine Co., 55 S. Jefferson St., Chicago, Ill., whose advertisement appears in this issue, are, at the present time, quite busy upon orders for power transmission machinery. Their capacity is large for the turning out and prompt filling of orders for shafting, pulleys, hangers, gearing, take-ups, friction clutches, etc., and will be pleased to mail their latest catalogue to mill owners about to enlarge their facilities or build new works.

—The Pepper Mfg. Co., knitting machine builders, Lakeport, N. H., are making many improvements and changes, as are required to produce the many different kind of fabrics which are being called for, particularly in plain and rib striped work in guages running closely to the extremes, from the coarse Klondike stockings, as well as boys' sweaters in ribbed work, to the fine guage plain stripes in sporting goods. Notwithstanding the depression in trade, this company have but little reason to complain, as they have had, and are still receiving, sufficient orders to enable them to keep their works in full operation.

—John J. Ryan, wholesale dealer in cotton, wool and merino waste, Troy, N. Y., removed from Adams St., into more commodious quarters at 145 River St.

—H. Brinton & Co., builders of seamless and rib knitting machinery for hosiery and underwear, Philadelphia, have been, and still are, very busy in all of their lines of machinery building.

—The Lamb Manufacturing Co., Chicopee Falls, Mass., have opened a knitting machine department in the Wool Exchange Building, room 505, New York City, under the management of E. D. Sanborn, who has been connected with the company for nearly twenty-five years.

—James Taylor, 835 Arch St., Philadelphia, has, we believe, the largest and most comprehensive stock of knitting machinery that can be found in America. He has recently been obliged to rent an additional large room, as well as a large storeroom in West Philadelphia.

—The New Bedford, (Mass.), textile school is getting ready to accomplish something. Gov. Wolcott has appointed two State trustees of the institution, Andrew G. Pierce and Joseph F. Knowles; and at a meeting of the corporation Herbert E. Walmsley, agent of the Wamsutta corporation; George A. Ayer, superintendent of the City mill, and John W. Knowles, superintendent of the Acushnet mills, were chosen trustees to fill vacancies. As soon as the State trustees have qualified, President George E. Briggs will call a meeting for final organization. George W. Hillman has resigned as secretary, and Robert Burgess, superintendent of the Pierce mill, has been elected in his stead. The corporation is talking of the eligibility of various sites, and it is thought that within a few months the school will be far on its way toward its actual operation.

—James Taylor, 835 Arch St., Philadelphia, is offering for sale the plant of carding, spinning, knitting and finishing machinery formerly operated by the Underhill Manufacturing Co., of Nutley, N. J. Mr. Taylor has prepared a circular in which the machinery is listed, and as it comprises a very complete list of woolen and knitting machinery which is offered for sale at a great sacrifice, we would advise manufacturers to send for one of the circulars. Besides machinery, there is also a considerable amount of wool spun and cotton spun yarns. The plant will be sold either whole or separately.

The Spring Grove Spinning Mills, recently erected and equipped by Charles Chipman's Sons, Easton, Pa., for the manufacture of superior quality of mule spun hosiery yarns, have placed the selling agency of their surplus production, in the hands of the American Spinners' Cotton Yarn Exchange, 45 Milk St., Boston, for the New England States and New York State. These mills have felt compelled to erect a mill to spin their own consumption, as they desire a superior quality of yarn to meet their requirements, and could see no other way out of it but to make their own yarn, from the highest grade of American cotton, fin-

ished in white, mock Egyptian and aniline blacks, both cops and cones. These mills are among the finest and best equipped for hosiery purposes in the country, and the quality of their production is unexcelled.

The Lowell Machine Shop, of Lowell, have just given another instance of their generosity toward the cause of textile education by their gift of a set of their new worsted drawing and spinning to the Philadelphia Textile School. This matter has recently been arranged and will be the cause of much satisfaction to the friends of this splendid institution, which will now be equipped in all branches of textile manufacturing, including cotton, woolen and worsted, while in the weaving department, they cover almost every class of fabrics.

E. A. Flanders, No. Dexter, Me., is giving most excellent satisfaction in the quality of cloth boards and box shooks that he is furnishing to manufacturers. Mr. Flanders possesses excellent facilities for turning out these products, and the lumber that he uses is of the best quality.

The Branson Patents.

We learn that the Branson Machine Co. has perfected arrangements with Edwin R. Branson to build knitting machinery under his patents and is fully authorized to use his pioneer patent for lifting and dropping mechanism granted December 29th, 1885. We are also informed that notices have been sent out to various infringers of this patent, warning them to desist at once and make settlement and that preparations for suits are about completed, as the Bransons intend to vigorously protect their interests.

Columbia Sizing.

The Columbia Mfg. Co., 141 Pocasset St., Fall River, Mass., call the attention of manufacturers to Columbia sizing. They make the strong claim for their preparation that four to six pounds will go as far and give better results than twenty pounds of most others. Whether this claim is true or not can be easily demonstrated by a trial order, and that is just what they are desirous of having an opportunity of proving.

A New Winding Machine.

Although possessing extensive and varied manufacturing interests, Boston is not usually regarded as notably a manufacturing centre. Within a recent period, however, a Boston merchant, Hon. J. R. Leeson, calling to his aid a New England inventive genius, Simon W. Wardwell, Jr., has created a system of machinery for winding fibres, which in the judgement of experts, will control the world's winding methods for generations to come.

The Universal Winding system and its varied mechanism, are protected by 58 fundamental patents in the United States and 12 in the chief commercial countries abroad. The mobility of the system is such that it winds the finest yarn, with all intermediate diameters, to the largest cable of rope or wire, with equal ease and perfection of detail.

Illustrating the tendency of the stream, as well as accomplished results assured, a well known yarn agent has just received this brief, self-explanatory communication:

Kings County Knitting Mills, Brooklyn, N. Y., June 10, 1898.

"Mr. A. B. Sanford: Dear Sir: The new (Universal) winding process we are very well pleased with. We have been buying yarn, wound by this system, and must say that the cones he sends us are something grand. Each cone weighs about 2¾ pounds, and we put two sets a day upon our machine, without having any trouble. It saves us a great deal, as we do not have to rewind the yarn. We are always willing to pay a little more for our yarn wound that way. If you can get out winter yarn put up on those cones, we should like it very much. Yours truly

A. Rossman & Co."

Clearly Boston has good ground for hopeful anticipation of its manufacturing interests and reputation.

Maine Woolen Men.

The Maine Woolen Manufacturers held their annual meeting at Skowhegan, Me., June 16. The following officers were elected: Lewis Anderson, Skowhegan, president; E. E. Hussey, Sanford, secretary and treasurer; E. M. Goodale, Sanford; J. R. Pollock, Guilford; William Dobson, Pittsfield; A. C. Fuller, Hartland; D. R. Campbell, Sangerville, executive committee.

A New Belt Dressing.

There has been a growing demand among belt users for a more convenient form of belt dressing than the paste. The Joseph Dixon Crucible Co., Jersey City, N. J., are now placing on the market a solid belt dressing in round bars, about 8 inches long and 2 inches diameter. It makes a package convenient to the hand, and easy to apply even to fast running belts. The company does not claim that the solid dressing is as good a preservative of the life and elasticity of the leather as the Dixon paste, but it is quick to apply and quick to act, and that is what is wanted by the general run of belt users.

About Boilers.

The Mutual Boiler Insurance Co., 31 Milk St., Boston, has issued a number of pamphlets that manufacturers should obtain and carefully read. Circulars 4, 5 and 6 relate especially to the cost of boiler room labor, bad shovelling; comparative steam-making values of coals used in the North Eastern States; and tests of steam pipe and boiler coverings. This company is making a fine record for itself, having paid a dividend of 33⅓ per cent, May 2, 1898. It is engaged in the frequent inspection of boilers, and the work that it performs is done in a most thorough manner. It issues policies covering damages to property and employees. Expert reports are furnished by it on the relative values of coals, stoking, and other matters affecting the manufacture of steam. Edward Atkinson is president, David W. Lane, secretary, and R. S. Hale, consulting engineer.

Philadelphia Textile School.

A very handsome bound circular of this school has been issued for its fifteenth season, 1898-99. Those interested in the school would do well to write for a copy of this circular. It contains a list of the officers, trustees and committees; a calendar for the school year; historical sketch; courses of study; fees; examinations, etc., etc.

The Berlin Iron Bridge Co.

The Berlin Iron Bridge Co., East Berlin, Conn., are well engaged in filling orders for structural steel work, etc., as will be noted in the following items: The United Gas Improvement Co., Philadelphia, are making extensive additions to their gas producing plants, all of their buildings being of steel frame construction, brick side walls and slate roofs, supported on metal purlins, carried by clear span trusses. The steel work is supplied by the East Berlin Co.

The designs of the extensive additions to the manufacturing plant of Wilmot & Hobbs Mfg. Co., Bridgeport, Conn., were made by the Berlin Co. The machine building of the Bridgeport Co. is about 80 feet long and 135 feet wide, and three stories high. This building is of steel skeleton construction throughout. The floors are designed for heavy loads, and are carried on corrugated iron arches supporting concrete filling.

The Bryant Electric Co., Bridgeport, Conn., are erecting a new two-story power house with brick side walls and steel skeleton frame work, the designs and steel material being furnished by the Berlin Co.

The Waterville Cutlery Co., Waterville, Conn., are having a steel roof placed over one of their new buildings, with trusses of steel and the covering of corrugated iron, lined with anti-condensation fire proof lining, all furnished by the Berlin Co.

The steel work for the new power house now being erected by the Port Chester Street Railway Co., Port Chester, N. Y., was designed and is being erected by the Berlin Co.

Recent Sales of Mill Shares.

	Lowest.	Highest.
Border City	100	102½
King Philip	85	90
Stafford	90	90
Boott	800	800
Atlantic	47	47½
Appleton	100	100⅛
Lawrence	100	100½
Wamsutta	78	78
Lyman	50⅛	52
Merrimack	899	905
Nashua	455	455
Amoskeag	1290	1300
Seaconnet	90	90
Union	136	136
Lancaster	275	302½
Barnaby	85	85
Shove	85	85
Franklin	95	95
Bates	102¼	102¼
Massachusetts	76¾	80¼
Great Falls	140½	140½
Lowell Bleachery	87	87
Cornell	95	95
Lockwood Co	60	60⅛
Naumkeag	50	50¼
Flint	90	90

Seashore is all Serene.

Last Vestige of the "Scare" Has Passed and Hotel Men are Happy.

After all the misgivings indulged in by hotel proprietors and owners of seashore cottages, it looks as if the coming season at the New England beaches would be in no way different from any of its predecessors, unless to be more successful than many of them.

The little "scare" following the suggestion that the Spanish fleet might pay a flying visit to our northern shores and contribute a trifling midsummer excitement to some of our popular resorts, died away almost before it took well defined shape. It was like the general trepidation that filled the public heart about the time the war itself was declared, and which has given way to a feeling of calmness and almost indifference.

Since it has become apparent to even the most timid that the time when Spain could have sent an armada against the New England coast long since went by, and that the seat of war must now be confined to a point even south of America's winter resorts, the courage of those who like to enjoy their summer vacation by the seaside has wholly returned. So pronounced has been the change of feeling that very few people, indeed, are likely to remain away from the beaches this summer because of any fear of the Spanish.

The hotel people, who were naturally very much depressed at the outset, are now looking forward to an excellent season, and the only enemy they have to fear now is unseasonable weather. Most of the big houses have booked their usual quota of guests at this date, and the officials of the Boston & Maine Railroad's passenger and ticket department, who are the most infallible authorities on such questions, report that the outlook for an average season is very encouraging.

Requests for the Company's illustrated booklet "All Along Shore," (which, by the way, is sent to anyone on receipt of two cent stamp,) are unusually numerous this month.

New England Lakes.

New England's lakes are the rarest gems with which a bountiful nature has endowed her. They have an exquisite beauty which has stirred the muse of poets, a romantic environment which has tinctured the writings of historians, and an almost supernatural charm which, ages ago, caused the aboriginal dwellers in the land to mutely worship them. There is no portion of its broad and beautiful summer domain to which the Boston & Maine Railroad Company would more willingly direct the attention of those who are bent on the enjoyments of an inland summer vacation. It cheerfully does this, not only because the natural beauty and healthfulness of these charming lake resorts abundantly warrants it, but because most of them are now prepared to entertain summer visitors in a manner fully befitting the requirements of the modern vacation seeker.

In a beautifully executed album published by this railroad will be found 31 photographic views of some of the more important of these aqueous brilliants of New England's crown. There are a score

or more of others, less renowned, but scarcely less attractive in their sylvan loveliness, and no portion of the far-reaching Boston & Maine system is without them.

Of these "gems of the first water," the first that naturally comes to mind is Winnipesaukee, the largest and in many respects the grandest. Then will follow that glorious Vermont-Canadian possession, Lake Memphremagog, with its majestic hill-sentinels and crystal depths; Willoughby and Massawippi, its near neighbors of smiling mien; Sunapee, the dark-eyed "granite-throned queen"; Echo Lake and Profile Lake, hidden among the jealous mountains of northern New Hampshire; Newfound and Squam, with their milder charms; and Dublin and Spofford, in the smiling southwestern country—each with its own peculiar characteristics, and all with their hosts of ardent lovers. Surely such a scenic feast has never been set before the eye of man within such comparatively circumscribed limits of space.

The "lake country" of England is embalmed in the literature of the age, but the "lake country" of New England is all New England itself. Massachusetts and Vermont, Maine and New Hampshire, each vies with the other in friendly rivalry to add to the sum total of the world's happiness in respect to this form of human enjoyment—for after all, what is more condusive to rest of body and peace of mind than a quiet vacation upon the shores of some retired lake?

MILL NEWS.

Cotton.

New Mills.

—Alabama, Anniston. The American Net & Twine Co. has been putting in machinery at its plant here and now has the mill completely equipped. The weekly capacity is 20,000 lbs. of finished twine and they have large orders on hand.

—*Alabama, Tuscaloosa. A contract for the new plant of the Tuscaloosa Wadding Co. has been let, and the mill will probably be ready for machinery about August 10.

—*Georgia, Griffin. The Kincaid Mfg. Co. has recently received through its New York selling agents a contract for 50,000 yards of cloth for army uniforms, and will start work immediately on their new building, mention of which was made last March. This will include 6,000 spindles and 200 looms.

—*North Carolina, Concord. We note that work has been started on the building for a new cotton mill here under the management of Lippard & Barrier, on East Depot Street.

—North Carolina, Mt. Pleasant. The Kindley Cotton Mills at this place have been running on double time for a long period, but have now decided to double the capacity of the plant. Probably a new mill will be built this summer or next fall.

—*South Carolina, Graniteville. The Warren Mfg. Co. is now installing machinery in its new 30,000 spindle mill.

Enlargements and Improvements.

—*Georgia, Augusta. The exact equipment of the new mill of the John P. King Mfg. Co. as given to us direct is 60,384 spindles and 812 looms. Their new addition of 20,000 spindles and 600 looms has just been completed, giving the total as above.

—Georgia, Augusta. The Riverside Mill, product of which is batting, will probably be enlarged in the near future so that its capacity will be double. The present capital stock of $150,000 will probably be increased to $300,000.

—Georgia, Stone Mountain. The Annestown Cotton Mills at this place are erecting an addition and also intend building a knitting mill.

—Massachusetts, Fall River. The Bourne Mills have announced that they will throw out their common looms and replace them by 1300 Northrop-Draper looms.

—Massachusetts, Thorndike. The Thorndike Mfg. Co. is building an addition to the dye house at Mill No. 2.

—New Hampshire, Newmarket. The Newmarket Mfg. Co. are putting in 10,000 spindles made by Fales & Jencks Co. of Pawtucket. These mills are running full time.

—North Carolina, Goldsburg. The Wayne Cotton Mills have completed an addition, 30x50, to contain slashers and warpers. The entire plant is running night and day.

Mills Starting Up.

—*Massachusetts, Taunton. The strikers at the Corr Mfg. Co., returned to work, June 11th, the company having granted no concessions and the men being taken back as individuals. The mills are now running full.

Mills Shutting Down.

—Connecticut, Glasgo. The Glasgo Yarn Mills are running four days a week.

Woolen.

New Mills.

—*Kentucky, Phil. The Green River Woolen Mills, recently destroyed by fire, with a loss of about $3,000, are being rebuilt, and the mills will probably be ready to start in the fall.

—*Maine, Phillips. The Phillips Woolen Co. is the name of the corporation organ-

ized to rebuild the plant formerly operated by Hescock & Atwood. The officers are: president, E. J. Rop; treasurer, Geo. B. Sedgeley. Capital, $10,000.

—*Pennsylvania, Hulmville. The new building for Frederick Rumpf & Sons, is well under way. George C. Dietrick of Philadelphia, has the building contract. The mill is 80x400, three stories, largely of stone, and will employ probably 200 or 300 operatives.

Enlargements and Improvements.

—Maine, East Wilton. The Walker Mills, James Walker, superintendent, have added one set of 48in. cards and two 250 spindle mules and a new weaving shed has been built.

—Massachusetts, Easthampton. Work has been started on an addition to the finishing department of the Nashawannuck Mfg. Co. to be 33x62 ft. of brick, 3 stories and basement. The first floor will be used for shipping purposes, the second as finishing room and the third for box department. C. W. Smith has the contract.

—Massachusetts, Spencer. The mill of the Spencer Woolen Co., recently purchased by A. L. Taft of Oxford, is now closed during alterations and repairs and will probably be started very soon.

—*New Hampshire, Tilton. At the Buell Hosiery Mill, recently purchased by Robert H. Hart of Ashland, N. H., the knitting machinery has all been removed and the cards have been moved to the second story. Bates feeds have been attached to the cards and carding and spinning machinery will probably soon be started up under the management of William J. Collins, formerly at Dayville, Conn.

—New York, Lockport. The Lockport Felt Co. will repair and enlarge their mill, recently damaged by lightning, and will soon have the plant running to its full capacity. C. T. Raymond is secretary.

—New York, Utica. A new boiler has been put into the Globe Woolen Mill at this place. It is the largest boiler in the city.

Mills Starting Up.

—Connecticut, Rockville. The Rock Mfg. Co. has started the cards in what is known as the Leeds Mill, under the charge of Thomas Hewitt.

—Massachusetts, Monson. D. W. Ellis & Sons started their woolen mill June 13, after a shut down of about six weeks. During that time a new dye house was built and additions made to the carding and weaving room and some new equipment was installed.

—Massachusetts, Roxbury. The Roxbury Carpet Co., which closed down April 11th, started up its factory June 13th.

—Massachusetts, Uxbridge. The Happy Hollow Mill property situated in South Uxbridge and owned by Eugene A. Wheelock, has been sold to James B. McCann of Spencer, who is getting ready to start the mill on satinets. Mr. McCann was recently superintendent for Newton Darling of Spencer, whose mill has been recently bought by A. L. Taft of North Oxford. The following foremen have been secured, who were formerly at Spencer: Boss weaver, Daniel Cobb; engineer, Richard Finney; boss finisher, M. C. Jones. The plant has three sets of cards and 24 looms and probably 26 new looms will be added. A new store house, 30x80, will be built and four cottages. It has a water power and 80 h. p. engine. Price paid for property is said to have been $35,000.

—Massachusetts, West Fitchburg. The woolen mill owned by the Valentine estate has been sold by R. B. Denny, Boston, to parties who are to form a corporation and operate same. Names of purchasers have not been made public. This mill has been idle for several years and we believe was last operated by David McTaggert with four sets of cards.

—Massachusetts, Worcester. The carpet mills of M. J. Whittall, at South Worcester started up June 6 on full time, which is 60 hours a week, instead of 30, which has been their running time for the past month.

—*New Jersey, Stanwick. The Stanwick Carpet Mills, which shut down last month are now running half-time.

—*New York, Norfolk. The one-set woolen mill of W. S. Bennett, which was removed from Raymondville, is now running.

—New York, West Troy. The worsted mills of James Roy & Co., which were shut down about the first of May, will start up July 5th.

Mills Shutting Down.

—Connecticut, Glenville. The Hawthorne Woolen Mills shut down June 6.

—Massachusetts, Fitchburg. The Fitchburg Mfg. Co. have shut down their mills indefinitely. This company has operated the Rockville and the New Rock Mills. The product has been fancy dress goods and Jacquard novelties in mohair, silk and worsted.

—Massachusetts, Lowell. The Lowell Carpet Mills have shut down and will probably remain closed until the middle of July. This puts about 2,000 hands out of employment.

Knit.

New Mills.

—Georgia, Cedartown. George W. Wade and Edward S. Munford of Atlanta, Ga., will probably establish a knitting mill here to be known as the Juanita Mills. The mill will have a capacity of 300 dozen garments a day.

—*New York, Brooklyn. Bids are now being received by Archt. Henry Volweiller, 483 Hart St., Brooklyn, for the new knitting mill of Christian Zimmermann & Son of Apolda, Germany. Their American agent is Geo. Mueller, 55 White St., N. Y. We mentioned this project last November. We understand the building to be 110x45, of brick, two stories, located at the Northwest corner of Hamburg Ave. and Chauncy St., Brooklyn.

—New York, Depew. D. D. Austin of Amsterdam, N. Y., is negotiating with

authorities here regarding the establishment of a knitting mill provided the citizens will subscribe for $15,000 worth of stock.

Enlargements and Improvements.

—Pennsylvania, Elizabethville. Buffington & Enders, proprietors, Enterprise Hosiery Mill, are building an addition to their mill.

—Pennsylvania, Harrisburgh. It is reported that Pelgram & Meyer, proprietors of the Harrisburgh Silk Mills, at Second and North Sts., contemplate enlarging their plant.

Mills Starting Up.

—Pennsylvania, Collingdale. Emil J. Franks has bought the mill property formerly occupied by the Collingdale Manufacturing Co., Cor. Pusey & Sharon Aves., who will manufacture hosiery.

Mills Shutting Down.

—New Hampshire, Lakeport. The Winthrop Knitting Mills are closed down and it is not known when the plant will be started. This is a 7 set mill with 237 knitting machines. Product was woolen hosiery.

Silk.

New Mills.

—*New York, Watertown. The Elwood Silk Mfg. Co., formerly H. & E. E. Elwood of Fort Plain, N. Y., now have their plant in full operation here. They have 68 looms with space for 32 more and employ 112 hands. Business is fairly good considering general conditions.

—Pennsylvania, Newberry. The new silk mill which was erected recently at the corner of Erie Ave. and Centre St., by Wm. Youngman, will probably be started very soon. New machinery is now being put in. The building is 45x42, one story.

—Pennsylvania, Phenixville. Contract for the new silk mill of Johnson, Cowdin & Co. has been let by the Industrial Association to David Henry of Paterson, N. J., for $59,983. Mill to be completed by Oct. 1st.

Mills Starting Up.

—New York, College Point. The silk ribbon factory formerly occupied by Jacob Naf has now been re-opened by the National Braid Co. of Brooklyn, N. Y., who have purchased all the machinery. The mill has been idle for about two years. It is understood that the building has been leased for the present and it is expected that they will build a larger mill if satisfactory arrangements can be made.

Mil's Shutting Down.

—New York, Poughkeepsie. The Myhepo Ribbon Mills at College point will be closed after August 1, Manager Morris Frost having received a notice to that effect. This will put 95 operatives out of employment, mostly girls. It is understood that the plant will be moved to Pennsylvania.

Miscellaneous.

New Mills.

—*Massachusetts, West Millbury. Thomas Windle is rebuilding his wool scouring mill, destroyed by fire June 28, but the new plant will probably not be as large as the old one, though an increase may be made later.

—New Jersey, Lodi. The new silk dyeing and finishing establishment of the Boettger-Pierce Dyeworks, will probably be built this summer. The main building will probably be 400x300.

—New York, Jamestown. The Jamestown Towel Mills is the name of the new industry started here under the management of Preston, Field & Mackey. They have remodelled an old building and expect to have their machinery running in August. They will make Turkish and damask towels.

—New York, New York. The Long Island Hosiery Co. is a new corporation with a capital of $5,000. Directors are Minnie Keeney and Mary C. Heath, Rockville Centre, and Gertrude Boruk of New York.

—Pennsylvania, Philadelphia. Charles Techner and Charles Christo, have established the Amber Silk Dye Works at Amber St. and Alleghany Avenue.

—Province of Quebec, Valleyfield. The Northrop Loom Co., Canada, which we recently noted had been incorporated here, will build a new factory at this place, work on which will probably be started very soon. A. F. Gault is president of the company; directors, A. F. Gault, George Otis Draper, R. R. Stevenson, Samuel Findlay and Louis Simpson, general manager of the Montreal Cotton Co. It is hoped that the work will be completed this fall and it will have a capacity of about 20 looms per week. A bonus of $10,000 has been guaranteed by the town. The Montreal Cotton Co. has a number of Draper-Lothrop looms in operation at its mill here.

—Vermont, North Bennington. The A. M. Stockwell Co., which started a linen industry a short time ago in the old Vermont mill property, is employing at present about 50 hands, 40 of whom are women. It is thought that in several months, they will have over 150 employees on the pay roll.

Fires.

—Connecticut, Bridgeport. A fire occurred June 15 in the works of the Bridgeport Coach Lace Co., causing a loss estimated at $75,000 partially insured.

—Kentucky, Nicholasville. The hemp factory of John & Geo. Brown was burned June 2nd. 275,000 lbs. of hemp were destroyed. Loss was covered by insurance.

—Massachusetts, Lawrence. A fire occurred in the building occupied by the Lawrence Spindle & Flyer Co., on Ireland St., June 25th, causing $1,000 damage. Robert M. Smith, webbing manufacturer, is also located in this building and sustained heavy losses.

—Massachusetts, Worcester. The Piedmont Mill of the Hopeville Mfg. Co. was damaged by fire June 16th to the extent of $4,000. The fire started in the picker room on the second floor. The building and machinery are owned by Albert Curtiss. Loss covered by insurance.

—New York, Lockport. The Newfane Felt Mill was struck by lightning May 22nd and $7,000 damage done.

—New York, Sloatsburg. The shoddy mill of Hiram Knapp was burned to the ground June 22d. The loss is estimated at about $20,000. Some new machinery had recently been put in and the plant contained two pickers, five sets of cards and one garnett machine. It is understood that the property was not insured.

—Pennsylvania, Philadelphia. The Tonawanda Mill, operated by Cope & Co., Wayne Junction, was struck by lightning during the early morning of June 28th and the dye house and boiler house were destroyed. Loss about $10,000.

Facts and Gossip.

—Colorado, Denver. The Overland Cotton Mill Co. has secured a government contract for 300,000 yards of canton flannel.

—Connecticut, Norfolk. The Aetna Silk Co. has orders for government goods and the mill is running full time.

—Connecticut, Windsor Locks. It is now reported that the owners of the silk mill recently operated by Gudebrod Bros. have accepted the offer of Arthur H. Bottom to lease and operate the mills after July 1st. Mr. Bottom was recently superintendent for Gudebrod Bros.

—France, Paris. M. Chacot has been experimenting with spider's web silk for weaving and it is now reported that he has arranged to establish a large mill where an immense number of spiders will be kept and worked at regular hours. When the web from one spider has been used up, he will be fed and helped back to condition, while another will take his place. An expert in the habits of the insect will be in control and it is expected that this experiment on a large scale will be successful.

—Georgia, Atlanta. Pres. Lyman Hall of the State School of Technology announced at the closing exercises of the school, that a textile department will soon be added. The State recently made an appropriation of $10,000 for this purpose, provided an equal amount was raised by private subscription. This has been done.

—Georgia, Columbus. The new company which will operate the Eagle & Phenix Mills will have a capital of $600,000 at the start, and will probably issue $500,000 worth of bonds, in order to make needed improvements and to furnish ample working capital. It is probable that G. Gunby Jordan, who has been managing the mills will be elected president. At the recent sale, the bond holders bought the property for $500,000. 80 new Crompton looms have recently arrived at the mill, and are now being put in.

—Maine, Dover. The Brown Mfg. Co. has received government orders for 25,000 yards of flannel, which will keep the mill full time all summer.

—Maine, Hartland. The Linn Woolen Co. has orders for 3,000 blue government blankets and also expects orders for shawls for the Indians.

—Maine, Lewiston. The Libby & Dingley Spinning Co. has been organized at Lewiston. Capital $600,000. The officers are president, H. M. Dingley; treasurer, W. S. Libbey. Messrs. Libbey & Dingley are now proprietors of the Cumberland Mill and the Lincoln Mill, the latter having recently received some new woolen machinery.

—Maine, Sanford. At the Sanford Woolen Mills all departments are busy on orders for government blankets.

—Massachusetts, Andover. The Smith & Dove Mfg. Co. is running a part of its works until 10 o'clock every night, owing to large orders.

—Massachusetts, Fall River. At the stockholders meeting of the Robeson Mills, June 21, it was voted to reduce the capital stock from $260,000 to $13,000, and then to increase it to $78,000. This re-organization has been made to free the corporation from debt.

—Massachusetts, Franklin. The Norfolk Woolen Co. have elected Bradley N. Rockwood, treasurer and general manager in place of the late Wm. F. Ray.

—Massachusetts, Lawrence. The loom picker plant of John W. Barlow was started up immediately after the fire in one of the buildings which was not damaged. The steam plant was not injured. Insurance has not yet been adjusted, and it is not known whether the burned building will be entirely rebuilt or an effort made to repair it.

—Massachusetts, Lowell. E. S. Hylan, treasurer of the New England Bunting Co., reports that his business has increased to such an extent that it has been necessary to double the output of his plant and now has orders enough to keep the mill running for six months full time.

—Massachusetts, Methuen. We note the incorporation of the Lawrence Knitting Co., under Maine laws, with capital of $10,000. The officers are president, John D. Dodge; treasurer, George A. Hunting.

—Massachusetts, Methuen. The Methuen Co. has filled its large order for 500,000 yards of tent and uniform cloth for the government and has now discontinued night work.

—Massachusetts, New Bedford. Notices were posted June 14th of a reduction in wages at the Howland & Rotch mills. These are yarn mills which did not cut wages last January at the time of the reduction at the cloth mills.

—Massachusetts, N. Adams. It is now reported that Strong, Hewitt & Co., a new concern which expected to buy the Linwood Mill, will now look elsewhere, as the legal complications over the assignment of S. W. Barker have made this imposible.

—Massachusetts, Spencer. Beebe, Webber & Co., of Holyoke, have a large con-

tract for army cloth. 5,000 yards a week are to be made at the several mills of the company and at the Spencer Mills about 1-3 of the looms will be run on these goods. Finishing to be done at Holyoke.

—New Hampshire, Lebanon. The Riverside Woolen Co. is running its plant night and day on the government order, which they recently received for blouse lining.

—New Hampshire, Milton Mills. The Waumbeck Woolen Co. has been incorporated. Captial stock $60,000. This mill has been idle for some time and was recently reported as sold.

—New Hampshire, Nashua. A new corporation here is the Sprague Mfg. Co., to locate at this place.

—New Hampshire, Somersworth. The Great Falls Woolen Co. has received a large order from the government for linings of soldiers' uniforms and this order will be fielled by their New Dam Mill.

—New Jersey, Bloomfield. A notice has been issued by Thomas Oakes & Co. (woolen manufacturers) that the ten per cent. reduction made in wages during the dull times will be restored, commencing June 1.

—New Jersey, Salem. The Salem Knitting Mills have increased its force by about 25 hands.

—New York, Albany. The new corporation here is the Chas. Bentley Co., of New York City, to make lace and linen goods. Capital $50,000. Directors, Chas. E. Bentley, Harriet M. Bentley, and Sarah D. Bellows.

—New York, Amsterdam. John Van Arnim, overseer of carding at A .V. Morris & Sons' mill, has invented a feed roll attachment for second breaker and finisher cards, with which the Morris mills are now equipped and other mills are now becoming interested.

—New York, Cohoes. A reduction of 4 per cent. was made in the wages of the weavers, and some of the other operatives at the Harmony Mills, June 6, but it is understood that even at this reduction the weavers are getting 15 per cent. higher wages than the Fall River hands.

—New York, Cohoes. Kavanaugh & Co., proprietors of the Globe Mills, are now running nights on underwear for the army.

—New York, Cohoes. There is a rumor that the Victor Knitting Mills will be removed from this city and it is thought that the Brandywine Mill in Schenectady may be selected. The Victor Mills are now shut down, as reported last week.

—New York, Cohoes. Since the purchase of the controlling interest by Ex. Governor Flower, of the Hope Knitting Mill, it has been rumored that he will endeavor to put through the knit goods combination which Wm. H. Rowe had nearly completed just before his death last month.

—New York, Cohoes. The Atlantic Knitting Co. has received a government contract for $34,897 worth of underwear, and the Kavanaugh Co. received a contract for $38,998, which is the second contract the latter company has received. The Atlantic Company's mill has been shut down until recently.

—New York, Fort Hunter. Deputy Sheriff Christenson has attached the balance of the machinery and equipment at the Forrest Knitting Mills on behalf of the creditors and the property is offered for sale. This is the plant of which H. H. Trent was manager.

—New York, Little Falls. The Riverside Knitting Mills, Eugene Walrath, proprietor, have received a government contract for 100,000 suits of underwear for the army to be delivered within 60 days. A night force will be put on.

—New York, Little Falls. The court has appointed Robert E. Steele of Herkimer, as receiver for the Saxony Knitting Co. During the past weeks, judgments amounting to over $80,000 have been filed against Charles King, proprietor of the mill.

—New York, Rockton. It is believed that William H. Rowe, Jr., of Troy, will purchase the Red Star Knitting Mill at this place now owned by Seymour & Birch but operated by the Eagle Knitting Co., in which the late W. H. Rowe was largely interested.

—New York, Troy. The firm of Oliver & Roff, proprietors Green Island Knitting Mills, has been dissolved by mutual consent. Mr. Oliver retires and Isaac Roff will continue the business. This firm has operated the above mill for some time and the property is now in a prosperous condition.

—North Carolina, Charlotte. The Textile Specialty Co. has been organized by Wm. Whittam, Jr., A. T. Atherton and Arthur Whittam to handle general textile mill equipment.

—*Pennsylvania, Mont Alto. Oscar S. Riley's knitting plant, which was damaged by fire recently, had only been started up at Mont Alto May 1st. He operates 18 knittting machines on cotton half hose. He previously was located at Gettysburg.

—Pennsylvania, Lenni Mills. William Carson & Co., who operate the Brookside Mills near here have leased the Parkmount Mills of Burnley Butterworth & Co., and it is understood that the plant will soon be put in operation employing about 100 hands.

—*Pennsylvania, Philadelphia. The old firm of Hyndman & Moore, operating the Columbia Mill, Coral & Adams Sts., has been incorporated under the name of Hyndman & Moore Co. Their product is upholstery goods. $50,000 capital. John Moore president, James Pollock, treasurer, Wm. H. Hyndman is also interested in the corporation.

—Pennsylvania, Philadelphia. Judge Bros. Carpet Co., a Pennsylvania corporation, has succeeded the firm of William Judge & Bro., carpet manufacturers. Capital is $150,000. Officers, Wm. B. Judge, president; I. C. Kerkesiager, vice president; James Judge, treasurer and manager.

—Pennsylvania, Pottsville. The firm of Unger & Fertig, proprietors of the West End Knitting Mill, has been dissolved. Moses Leininger of Orwigsburg, Pa., has bought Mr. Fertig's interest and a new company will be organized.

PERSONAL RECORD.

Cotton.

—B. F. S. Austin, formerly overseer of weaving at the Gastonia Mills, Gastonia, N. C., has become weaving overseer at Fairfield Mills, Winnsboro, S. C. Jeff. Cole is now loom fixer at these mills again.

—B. F. Thompkins, secondhand of spinning at the Granby Cotton Mills, Columbia, S. C., has been appointed overseer of the spinning. Mr. Thompkins was formerly employed at the Piedmont Mills, S. C., and is but 25 years old.

—Tom Nance has resigned as spare fixer at Alabama City, Ala., to fill a similar position at the Exposition Mills, Atlanta, Ga.

—John A. Davis, of Galveston, Texas, has taken charge of the cloth room at the Cawthon Cotton Mills, Selma, Ala. He has had 10 years experience in this department.

—E. T. Barnes, boss spinner at Granby Cotton Mills, Columbia, S. C., has been engaged at the Union (S. C.) Cotton Mills as boss spinner.

—J. C. Foster, secondhand in carding at Mill No. 2, Clifton, S. C., has resigned owing to ill health and has removed to his farm near Cherokee Springs, S. C.

—Dennis Kiley, on account of ill health, has given up his position as overseer at Brownell & Co.'s twine mill, Moodus, Ct.

—Miss Sarah Monaghan, daughter of James Monaghan, overseer at the Pocasset Mill, Fall River, Mass., was married to Stephen O'Hara, of Lowell, Mass., on June 15th.

—P. C. Bryant, loom fixer at the Peoples Mill, Montgomery, Ala., has located at Alabama City.

—A. C. Lineberger, Treas. and Supt. of the Tuckaseege Mills, Mt. Holly, N. C. was married to Miss Mattie Hipp, on June 15th, at Charlotte, N. C.

—Early Grover, boss weaver and assistant superintendent at the Charleston, (S. C.) Cotton Mills, is reported to have accepted charge of the weaving at the Maginnis Cotton Mills, New Orleans, La.

—J. L. Keene, beamer at the Griffin, Ga., has accepted a position as secondhand in dressing department of the Kincaid Mills, the same city. J. A. B. Mehaffee is overseer at the Kincaid Mills.

—Edward Ward, for 30 years in the employ of the Atlantic Mills, Lawrence, Mass., has resigned. For a number of years he has been secondhand of weaving.

—Robert Hughes has succeeded Charles Slack as night carding and spinning overseer at the Naomi Mills, Randleman, N. C. Mr. Hughes was previously day card grinder, and Mr. Ferrington has succeeded him.

—Frank O. Walton, formerly manager of the Bellemont Cotton Mill, Graham, N. C., has recently gone to Fort Mill, S. C., having been appointed secretary and treasurer of the Millfort Cotton Mills.

—B. L. Ledwell, boss carder at Wadesboro, (N. C.) Cotton Mills, has resigned to accept the night superintendency with the O. A. Robbins Co., Charlotte, N. C.

—J. M. Gaston, of Concord, N. C., formerly engineer at the Atherton Mills, Charlotte, and the Dover Yarn Mills, Pineville, N. C., has engaged as master mechanic at the Rocky Mountain (N. C.) Cotton Mills.

—A. A. Milliken, of the Lawrence Mfg. Co., Lowell, Mass., is now secondhand in the Hamilton Mills cloth room.

—M. M. Fith, for the last two years loom fixer at the Dwight Mills, Alabama City, Ala., has been appointed secondhand of weaving at Cottondale, Ala. He worked formerly at Cottondale and as he is thoroughly familiar with the antiquated looms, he will doubtless be of much service to his employers.

—W. E. Poag, boss carder and spinner of the Cabarrus Cotton Mills, Concord, N. C., has secured a similar position with the Victoria Cotton Mills, Rock Hill, S. C.

—W. A. Hill, of Nebraska, who for 24 years been slashing, has now been appointed slasher tender at Cawthon Mills, Selma, Ala.

—A. B. Clements, loom fixer at the Maginnis Mills, New Orleans, La., is now second of No. 3 weave room.

—E. F. Wells has resigned as overseer of spinning at the Atlantic Cotton Mills, Lawrence, Mass. The help presented him with a handsome watch chain and charm.

—Thomas Pickup has resigned as secondhand of weaving at No. 4 mill, Lonsdale, R. I., after having served 15 years in that capacity. The employees presented him with a handsome gold watch and chain.

—R. C. Sligh, cloth overseer of Alabama City, Ala., has secured the position of overseer of cloth room at Charleston, S. C., under Supt. J. F. Schirmer.

—Charles W. Weaver has resigned as overseer of the carding department at

the Newmarket Mfg. Co., Newmarket, N. H.

—George E. Chapman, who for the past five years has been second hand in the spinning room of No. 2 mill of the Lockwood Co., Waterville, Me., has resigned to accept a position as spinning overseer of a Millville mill. Upon his taking leave, he was presented with a handsome watch chain and a silver service.

—James E. Briggs, boss weaver and designer for the past two years at the Pequot Mills, Montville, Conn., has resigned.

—Thomas Pennington has resigned as overseer of weaving at Shove Mill No. 1, Fall River, Mass.

—Micheal Mullaney has secured a position as overseer of the mule room of the Androscoggin Mills, Lewiston, Me. Mr. Mullaney recently resigned from a similar position at the Acushnet Mill Corporation's mill No. 2, New Bedford, Mass.

—George Montgomery, recently in the finishing department of the Slatersville, R. I., Mills, is now engaged in Pawtucket in a similar position.

—Timothy McAuliffe has been appointed secondhand in the Atlantic Mill mule room, Lawrence, Mass.

—Amos Grankshaw has resigned as overseer of carding at the Merchants' Mill, Fall River, Mass., to accept a similar position at the Richard Borden Mills.

—George Ladd, of Dayville, Conn., has removed to Ashland, N. H., where he has been employed as boss finisher.

—John Crossland has resigned as foreman carder at the Union Cotton Mills, Moosup, Conn.

—George I. Cain, formerly at the Warren, (Md.) Cotton Mills, the Congaree Mill, Columbia, S. C., Bamberg (S. C.) Cotton Mills, and for the last year superintendent of the Monroe (N. C.) Cotton Mills, has removed to Chester, S. C. to start up, in the near future, the Catawba Mills.

—John T. Norris, recently overseer of the Millfort Mill, Fort Mill, S. C., is now in charge of the night spinning and twisting at the Monroe Cotton Mills, N. C. John Black has given up the night twisting at Monroe.

—Benjamin F. Houston, Assistant Superintendent of the Monroe Cotton Mills, N. C., has removed to Lando, S. C., to accept the superintendency of the Manetta Mills. W. C. Heath is secretary of both the Monroe and Manetta Mills.

—J. R. Ellis, engineer for a number of years at the Kincaid Mill, Griffin, Ga., has been engaged as superintendent of the new Paragon Mill, Cedartown, Ga. Travis Bryant is his successor at the Kincaid Mill.

—C. C. Miller has become overseer of the dyeing department at the Roanoke Mills, Roanoke Rapids, N. C., Charles Welch, formerly a loom fixer, succeeded Mr. Miller as boss dyer at the Thistle Mills, Ilchester, Md.

—C. V. Upchurch, recently superintendent of the Manetta Mills, Lando, S. C., has succeeded T. C. Gore as night superintendent of the Anchor Cotton Mills, Huntersville, N. C.

—W. C. Heath, Sec. and Treas. of the Monroe (N. C.)Cotton Mills, has undertaken the position of superintendent as well, with William H. Norris, formerly of the Mountain Island, (N. C.) Cotton Mills as assistant superintendent.

—T. S. Garner, formerly loom fixer at Gaffney (S. C.) Cotton Mills, has been engaged as second hand in weaving at No. 2 Exposition Cotton Mills, Atlanta, Ga.

—William H. Hawkins, night superintendent at the Monroe Cotton Mills, N. C., has resigned.

—Henry J. King has severed his connections with the Stafford Manufacturing Co., Central Falls, R. I., where he had been engaged as master mechanic for some years, and is now at work in a similar capacity at Providence. On leaving, Mr. King was presented with a handsome chair.

—Mr. Schofield, of Athens, Ga., has been engaged as superintendent of the Alpha Mill, Charlotte, N. C.

—J. A. Shinn, recently carding and spinning overseer of mill No. 2, China Grove, N. C., is now superintendent of the Victoria Cotton Mills, Rock Hill, S. C.

—D. B. Rodman, formerly superintendent of the cotton mills at Walhalla, S. C., has been appointed superintendent of the Gainesville, Ga. cotton mills.

—James W. Robertson, Pres. and Treas. of the Roswell Manufacturing Company, Roswell, Ga., has resigned.

—George W. Cumnock, Supt., Social Mills, Woonsocket, R. I., recently recently received severe injuries by being thrown from his carriage.

—C. C. Randleman has been appointed assistant superintendent of the cotton mills at Randleman, N. C.

—John H. Vernon, formerly second hand at the Narragansett Mills at Fall River, has accepted a position as weaving overseer at the Shove Mills of Fall River.

—D. E. Duggan has been elected superintendent of the Cordele (Ga.) Cotton Mills.

Woolen.

—Richard Love has resigned as boss weaver in Wm. Prendergast's Mill, Bridgeton, R. I., and has been succeeded by John Cahill, of Manton.

—W. H. Corson, of Providence, has been appointed boss finisher at the Madison Woolen Co's mill, Madison, Me. M. J. McGuirk is superintendent.

—Peter Holt has been emplayed at the Pondicherry Mills, Bridgeton, Me., as loom fixer. F. W. Seavey is overseer.

—John J. Pinder has resigned his position at the Lowell Carpet Co., Lowell, Mass., and has removed to Peabody.

—John Ferguson, formerly in the Berkeley Mill, Wales, Mass., has secured

charge of the dyeing at the Montville Woolen Co.'s mill, Montville, Mass.

—George Rumbellow has resigned as overseer of the weave room of the Hawthorne Mill, Carleton Place, Ontario. George Imeson, of Glen Tay, has succeeded him.

—J. D. Price, of Lowell, Mass., has succeeded the late boss dyer Henry Magner at the Pondicherry Mills, Bridgeton, Me.

—Peter C. Costello has been employed as overseer of the sewing room of the French River Textile Co., Mechanicsville, Conn.

—William Latimer has been appointed manager of the Maple Leaf Woolen mill at Markham. He was formerly superintendent in Gemmell's Woolen Mill, Perth, Ont.

—James H. Horsfall has been engaged as boss dyer by Taft, Burbank & Murdock, Proctorville, Vt.

—Edward Saunders has entered the employ of Johnson & Bassett, of Worcester. He resigned as boss spinner of the Hillsboro Woolen Mill, Hillsboro Bridge, N H.

—John Whalen, Jr., is now second hand in the finishing room at Campbell Mills, Potter Hill, R. I.

—W. H. Cohen, formerly in charge of the knitting department of the Fitch Mills, Rockville, Conn., has entered the employ of the United States Rubber Co., Woonsocket, R. I.

—Daniel Clark has resigned his position in charge of the finishing room at the Dews Woolen Mill Co., North Dexter, Maine, and Allen Moore, of Guilford, has been engaged to fill the position.

—John Shea, of Maynard, Mass., is now in the spinning department of the American Mills, Rockville, Conn.

—Frank J. Yochim has entered the employ of the Mystic Mfg. Co., Mystic, Conn., as loom fixer. He was formerly at Indian Orchard, Mass.

—John Turcotte, of Holyoke, is now secondhand of spinning, spooling, etc., at the Peck Mfg. Co., Pittsfield, Mass. Adolphus Sultaire is overseer.

—James Breen, of Gilbertville, Mass., has secured a position at the Springville Mill, Rockville, Conn.

—W. Henderson, of Gilbertville, Mass., has been engaged as loom fixer for the Thornbury Worsted Mills, Bristol, Pa. Jacob Auel is overseer.

—Lewis Bell, secondhand in E. M. Rockwell's Mill, Lemonster, Mass., has taken charge temorarily of the carding room in the Holliston Yarn Co.'s mill at Holliston, Mass. But three sets out of six are at the present time in operation.

—William M. Edes has been employed as boss dyer for the Penobscot Woolen Co., Dexter, Maine.

—Samuel T. Hall has resigned as overseer of weaving at the Coburn Woolen Mills, Skowhegan, Me., which position he has held for two years. He has been succeeded by Charles Green.

—Gustav Eckland, recently of the Merrimack Mill, Lowell, Mass., has accepted a position with the United States Bunting Co., Lowell.

—Walter Oliver is now engaged as assistant superintendent of the Mississippi Mills, Wesson, Miss.

—William M. Edwards has accepted a position in charge of the wet finishing at the Franklin Mills, Franklin Falls, N. H.

—Hiram Fisher has been appointed boss carder at the Fairfield Woolen Mills, Fairfield, Me.

—L. D. Green, formerly connected with the Zanesville (O.) Woolen Manufacturing Co., and recently with the Muskingum Valley Woolen Manufacturing Co., Dresden, O., has been appointed to take charge of a woolen mill at Lapeer, Mich.

—W. S. Morrow has accepted a position as boss carder at the Penobscot Woolen Co., Dexter, Maine.

—Clarence Stoll, who lost his arm in the machinery at the Louisville Woolen Co., Louisville, Ky., last February, and who brought suit through his father, Edwari Stoll, for $5,000 damages, has been awarded $1,600.

—F. C. Kenedy, agent and manager of the Winooski Woolen Mills, Winooski, Vt., resigned July 1. He was connected with the company 42 years and was manager 36 years.

—J. J. Hart, formerly superintendent of the Merrimack Mfg. Co., Lowell, Mass., resigned a few days ago to go into business for himself near Providence, R. I.

—John T. Geary, of Ware, Mass., has secured the position of loom fixer at the Carolina Mills, Carolina, R. I., succeeding James Cleary, who has been employed at Narragansett Pier, R. I.

—William Knox, formerly carder at North Vassalboro, Me., has removed to Woodstock to accept the position of superintendent of the Woodstock Woolen Mills Co., Woodstock, N. B.

—Frank Cushman, formerly assistant dyer of the Piscataquis Woolen Co., will fill Robert Houston's position as overseer of the Sangerville Woolen Co., Sangerville, Me., while Mr. Houston is on his vacation.

Knit.

—C. W. Harvey, boss knitter at the Capron Knitting Mill, has resigned and removed to Little Falls, N. Y.

—E. A. Herrick, superintendent Himes Underwear Co., Cohoes, N. Y., has resigned and is employed at the Clyde Mill, Waterford, in a similar position.

—Henry Scott, recently with Brodie & Co., Hespeler, Ont., has gone to Guelph to engage in the knit goods business and has started three hand machines on hosiery.

—Albert Stacey has succeeded George Bennett as boss spinner at the Green Is-

land Knitting Mill, Cohoes, N. Y. Mr. Bennett resigned to accept a position in the East.

—H. D. Buck has resigned as superintendent of the Diana Knitting Mills and accepted charge of the finishing with the Royal Knitting Co., St. Johnsville, N. Y.

—Warren B. Cotton, for 12 years overseer of finishing department of the Shaw Stocking Co., Lowell, Mass., has resigned. After an extended vacation, he will again enter into active business.

Silk.

—H. J. Spilman has given up the superintendy of Hess, Goldsmith & Co.'s Silk Mills, Wilkesbarre, Pa., and has accepted the superintendy and general management of a mill at Lancaster, Pa.

Miscellaneous.

—William Eadie, overseer of printing in the Merrimac Print Works, Lowell, Mass., has resigned and is succeeded by William Mears of the Hamilton Co.

—William Bogle, for 41 years connected with the Dutchess Print Works, Wappingers Falls, N. Y., the last 22 years of which time he was superintendent, has resigned owing to ill health. His son, John Bogle, who has been employed in all the different departments of the works, will succeed him.

Deaths.

—Edward C. Thayer, of Keene, N. H., died July 4. He was gorn in Uxbridge, Mass., in 1830. He was largely interested in the Berkshire Cotton Mfg. Co., Adams, and owner of the woolen mills at Ashuclot, N. H. Among his public gifts were the public library at Uxbridge, the public library at Keene, and nurses' home at Worescter.

—James Etchells, for many years in the machine shop of the Pepperell Mills, Biddeford, Me., died suddenly at the age of 65 years.

—Edward Dillaber, formerly a loom fixer in the Hamilton Woolen Co.'s mill, Globe Village, Mass., died from pneumonia in Fiskdale recently.

—John McLaughlin, who was employed at Sawyer's Woolen Mills, Dover, N. H., while operating an elevator, was caught between a bar and an elevator rod and killed instantly. He was 14 years old.

—J. R. James, secretary and superintendent of the Southwark Mills Co., Philadelphia, died May 11th, of apoplexy.

—Robert Wilbur, formerly boss weaver at the Fiskville Mill, Fiskville, R. I., died recently of heart failure.

—Moses Kilburn Whipple died recently in Worcester, age 67. The Whipple cotton mill, which he bought of L. J. Knowles in 1884, was built in 1815 by the Western Cotton Mfg. Co., and run from 1848 to 1860 by L. J. Knowles. In its early history yarn was bought from hand looms in farmers' kitchens for wool and tow fabrics. Uuder Mr. Whipple's management the mill comprised three floors, 60x40 feet each, running eleven 30-inch cards and 1296 Whitney gravity spindles, using 2000 pounds of cotton each week. About four years ago, through lack of customers, the mill sustained large losses and was sold to Sayles & Jenks, and it is now occupied by the Bradford Yarn Co.

—Jacob Mehlman, a prominent citizen of New Berlinville, Pa., died May 23d, from heart disease, age 74. For 18 years he was a carpet manufacturer at Bridesburg, subsequently removing to New Berlinville.

—Ex-Senator William F. Ray, of Franklin, died suddenly on May 24th, of heart failure. He had succeeded his father, the late Frank Ray, as owner of the Ray Fabric Mill in Unionville.

—Benjamin F. Clark, senior member of the Clark & Hoisapple Manufacturing Co. and proprietor of the Pacific Hosiery Mill, Cohoes, N. Y., died in that city on June 18th.

—James S. Shepard, of Canton, Mass., died June 8th, age 82 years. Early in life, Mr. Shepard was in charge of the carding room in the mill of Geo. H. Mann, Sharon, and was rapidly promoted until he had entire charge of the mill. In 1840, he took charge of a cotton mill in Ashburton, and four years later purchased the cotton mill of Vernon A. Messinger, and in 1851 bought the thread mill of Southworth & White, which he fitted up for the manufacture of seine twine. The American Net & Twine Co. was a large buyer for 18 years of the product, and after the war Mr. Shepard became a partner of that company. In 1879 the partners formed a corporation, having previously erected a mill in Cambridge. The concern recently moved its Canton industry to Anniston, Ala.

—Benjamin B. Knight of the firm of B. B. & B. Knight, died June 5th, at Providence, R. I., age 85 years. A widow and two children survive him.

—Joseph C. Parker, of Hartford, Conn., died June 21st. He as born in Plainfield, N. H., Oct. 28th, 1823. When 34 years, he engaged in the woolen business in Barre. Soon after, with Denison Taft, he began the manufacture of flannels in William Jarvis' Mill, Quechee, Vt., and for the last 32 years has been the senior proprietor of J. C. Parker & Co.

—Shubael W. Brayton died Sunday, June 23d, 75 years. In 1852, with Rodman and Henry N. Wells, he engaged in the manufacturing business at the Beaver, under the firm name of Wells, Brayton & Co. A mill was built in which they manufactured satinets for about 10 years, when Messrs. Wells resigned, and the firm name changed to S. W. Brayton & Co. and the late Sylvander Johnson as a silent partner. In 1868 the mill was burned and the firm dissolved. A short time after Mr. Brayton rebuilt the mill and began the manufacture of shoes, which mill later on was used as a cotton factory by Gallup & Houghton.

—Jonathan A. Lane, of Boston, died June 5th, age 78. At the age of 15 he started to work with Calvin, Washburn & Co., goods jobbers on State St. In 12 years he succeeded to the business with Chas. A. Whitin as special partner. The firm name was then Allen, Lane & Washburn, but later was changed to Allen, Lane & Co. The Allen-Lane Co., of which he was a member at his death, is the oldest woolen commission house in Boston.

BUYERS' INDEX.

Advertisers whose names do not appear under desired headings will please notify the publishers. Such omissions are accidental, not intentional.

Alphabetical Index to Advertisements follows this Classified List.

Architects and Mill Engineers.

Berlin Iron Bridge Co, The, East Berlin, Ct.
Ferguson, John W, Paterson, N. J.

Automatic Boiler Feeds.

D'Este & Seeley Co, 29 Haverhill St, Boston,

Automatic Feeds for Cotton and Wool.

Harwood, Geo. S, & Son, 53 State St, Boston.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Balling Machine.

Torrance Mfg. Co, 18 Davis St, E. Newark, N. J.

Bandings.

See under Yarns.

Belting.

Alexander Bros., 410 No. 3d St., Phila., Pa.
Billington, J. H. & Co., 113 Chestnut St., Philadelphia.
Boston Belting Co., 256 Devonshire St., Boston, Mass.
Fell, Geo. & Son, Bolton, England.
Link Belt Machinery Co., Chicago, Ill.
Ulmer Leather Co, Norwich, Conn.
See also Mill Supplies.

Belt Dressing.

Alexander Bros, 410 No. 3d St, Phila, Pa.

Bindings.

See Tapes and Braids.

Bleaching Materials.

Roessler & Hasslacher Chemical Co, 100 William St, New York.

Boiler Compounds.

Carr Manufacturing Co., 69 Beverly St, Boston.
Imperial Chemical Co, 324 American St, Phila, Pa.

Boxes, Cloth Boards, Etc.

Flanders, E A, North Dexter, Me.
Pearson, J. T, Kensington, Pa.

Braids.

See Tapes, Braids and Edgings.

Burr Pickers.

Curtis & Marble Machine Co., Worcester, Mass.
Sargent's, C. G., Sons, Graniteville, Mass.

Card Clothing.

Ashworth, Elijah, Fall Biver, Mass.
Leigh, Evan A, 35 Mason Building, Boston.

Calico Printers' Machinery and Supplies.

Butterworth, H. W., Sons & Co., Philadelphia.
New Bedford Copper Co, New Bedford, Mass.
Phillips Co, The Thomas, Providence, R. I.
See also Dyeing, Bleaching Machinery, etc.

Carders' Tools.

Brown, W. H, Mechanic St, Worcester, Mass.

Carpet Machinery.

Altemus, W. W, & Son, 2816 N. 4th St, Phila, Pa.
Crompton & Knowles Loom Works, Worcester, Mass.
Curtis & Marble Machine Co, Worcester, Ms.
Furbush, M. A, & Son, Machine Co, Phila, Pa.
Howard, Geo. C., 1783 Barker St., Phila., Pa.

Chemicals and Apparatus.

Bullock & Crenshaw, 528 Arch St, Phila, Pa.
Roessler & Hasslacher Chemical Co, 100 William St, New York.

Chemist.

Adriance, John S., 105 East 39th St., New York.

Cloth Testing Machine.

McKnight, S, 771 Broadway, New York.

Combs (Wool and Cotton).

Crabb, William, & Co, Newark, N. J.
Townsend, Thomas, 157 Orange St., Providence, R. I.

Comber Needles.

Townsend, Thos., Providence, R. I.

Commission Merchants.

Hayes, O. H, & Co, New York.

Copper Print Rollers.

New Bedford Copper Co, New Bedford, Mass.
Phillips Co, The Thomas, Providence, R. I.
Revere Copper Co, 174 Oliver St, Boston.

Copper Work for Dyers.

Phillips Co, The Thomas, Providence, R. I.

Cotton (Egyptian).

Stoddard, Haserick, Richards & Co., Boston.

Cotton Machinery.

Altemus, W. W, & Son, 2816 N. 4th St, Phila-Pa.
Ashworth, Elijah, Fall River, Mass.
Cobb, Thad. S., Machinery Co., Lowell,
Crompton & Knowles Loom Works, Worcester, Mass.
Curtis & Marble Machine Co, Worcester, Mass.
Draper Company, Hopedale, Mass.
Fairmount Machine Co, 22d and Wood Sts, Philadelphia.
Howard & Bullough American Machine Co, Pawtucket, R. I.
Kilburn, Lincoln & Co, Fall River, Mass.
Leigh, Evan A, 35 Mason Building, Boston.
Lowell Machine Shop, Lowell, Mass.
Mason Machine Works, Taunton, Mass.
Payne, Geo. W, & Co, Pawtucket, R. I
Phillips Co, The Thomas, Providence, R. I.
Stoddard, Haserick, Richards & Co, Boston, Mass.
Townsend, Thomas, 157 Orange St., Providence, R. I.
Whitin Machine Wks, Whitinsville, Mass.
Woonsocket Machine & Press Co, Woonsocket, R, I.

Cotton Openers and Lappers.

Howard & Bullough American Machine Co, Pawtucket, R. I.

Cotton Presses.

Planters' Compress Co, 89 State St, Boston.

Cutters for Knit Fabrics.

Kennedy, Thos. (Cutters, etc.,) Cohoes, N. Y

Damper Regulators.

D'Este & Seeley Co. (Curtis), 29 Haverhil St, Boston, Mass.

Designers.

Fresnel, Gustave, 125 W. 56th St, N. Y.

Dryers.

Philadelphia Textile Machinery Co, Philadelphia, Pa.
Phillips Co, The Thomas, Providence, R. I.
Sargent's, C. G., Sons, Graniteville, Mass.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass.

Dusters.

See Wool and Waste Dusters.

Dyeing, Bleaching and Finishing.

Brophy's, T, Sons, Jasper St, Philadelphia.
Greenwood, R, & Bault, Frankford, Pa.

Home Bleach & Dye Works, Pawtucket and Valley Falls, R. I.
Littlewood, G. J., & Sons, Manayunk, Pa.
Warren, W, Thread Works, Westfield, Mass.
Webster Dye Works, Webster, Mass.

Dyeing, Drying, Bleaching and Finishing Machinery.

Butterworth, H. W, & Sons Co, Phila, Pa.
Curtis & Marble Machine Co, Worcester, Mass.
Fairmount Machine Co, 22 and Wood Sts, Philadelphia.
Granger Foundry & Machine Co, Providence, R. I.
Hopkins, A, & Co, Bridgeton, R. I.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Lincoln, The, Co, 54 Arch St, Hartford, Ct.
Phenix Iron Foundry, Providence, R. I.
Phillips, The Thomas Co, 91-95 South Main St, Providence, R. I.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass. (Drying.)
Woonsocket Machine & Press Co, Woonsocket, R. I.
Woonsocket Napping Machine Co, Woonsocket, R. I.

Dye Sticks.

Haedrich, E. M, 311 1-2 Walnut St, Phila, Pa.

Dyestuffs and Chemicals.

Amend Process Co., 205-211 Third Ave., New York.
Anchor Color Mfg. Co, 464 Cherry St, New York.
Bischoff, & Co, 87 Park Place, N. Y.
Bosson & Lane, 36 Central Wharf, Boston.
Cochrane Chemical Co., 50 Kilby St., Boston.
Corey, S. J, 273 Congress St, Boston.
Dillon & Co, 20 Cedar St, New York.
Farbenfabriken of Elberfeld Co, 40 Stone St, N. Y.
Geisenheimer & Co, 189 Front St, New York.
Hanna-Schoellkopf Co, Philadelphia, Pa.
Holliday, Read, & Sons, 100 William St., New York.
Innis & Co, 3 Cedar St, New York.
Jaeck Bros., The, Co., 62-68 No. 11th St, Brooklyn, N. Y.
Janney, O. S, & Co, Phila. and Boston.
Johnson, Chas. A, & Co, 22 Dey St, N. Y.
Johnson, Wm. G, & Co, Uncasville, Conn.
Keller, John J, & Co, 104-106 Murray St, N. Y.
Klipstein, A, & Co, 122 Pearl St, N. Y.
Koechl, Victor, & Co, 122 Hudson St, N. Y.
Matheson, W. J, & Co, 182-184 Front St, N. Y.
Merrimac Chemical Co, Boston, Mass.
N. Y. & Boston Dyewood Co, 55 Beekman St, New York.
Oakes Mfg. Co, 93 Pearl St, N. Y.
Phillips (Moro) Chemical Co, 131 S. 3d St, Phila., Pa.
Pickhardt & Kuttroff, New York.
Roessler & Hasslacher Chemical Co, 100 William St., New York.
Sharpless Dye Wood Ext. Co, 22 N. Front St, Phila, Pa.
Stamford Mfg. Co, 133-137 Front St., N. Y.
Stone & Ware Co, The, 157 Maiden Lane, N. Y.
Sykes & Street, 85 Water St, N. Y.
Thomas, N. Spencer, Elmira, New York.
Webster Dye Works, Webster, Mass.

Dyers and Finishers.

Boston Finishing Works, Williamstown Mass.
Cranston Worsted Mills (yarns), Bristol R. I.
Firth & Foster Co, Kensington, Pa.
Greenwood, R. & Bault, Frankford, Pa.
Home Bleach & Dye Works, Pawtucket, R. I.
Oakdale Dye Works, 913 W. York St, Phila, Pa.
Pawtucket Dyeing & Bleaching Co, Pawtucket, R. I.
Warren, W, Thread Works, Westfield, Mass.
Webster Dye Works, Webster, Mass.

Dyers' Clogs.

Wildman, Jos, & Co, 1908 N. Front St, Phila.

Edgings.

See Tapes, Braids and Edgings.

Electrotyping and Printing.

Whitcomb, H. C, & Co, Boston.

Elevators.

Cohoes Foundry & Machine Co, Cohoes, N.Y.
Eastern Machinery Co, The, New Haven, Conn.
Howard, Geo. C., 1783 Barker St., Phila., Pa.

Engineers, Mechanical.

Berlin Iron Bridge Co, E. Berlin, Ct.
Ferguson, John W, Paterson, N. J.

Express Money Orders and Travelers' Cheques.

American Express Co. offices in every city

Fans—Exhaust and Ventilating.

See Ventilating Apparatus.

Feeders

See Card Feeds.

Feed Water Pumps.

Goulds Mfg. Co, Seneca Falls, N. Y.
Phœnix Iron Foundry, Providence, R. I.

Finishing Machinery.

See Dyeing, Drying, Bleaching and Finishing.

Fluted Rolls.

Cohoes Foundry & Machine Co, Cohoes, N.Y
Thurston, A. G, & Son, Box 528, Fall River, Mass.

Fulling Mills for Woolen Goods.

Hopkins, A, & Co, Bridgeton, R. I.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter Jas, Machine Co, No. Adams, Mass.

Gas Engines.

Jones, Lewis, 60½ and Media Sts, Phila, Pa.

Gas Singeing Machines.

Butterworth, H. W. Sons Co., Philadelphia.
Curtis & Marble Machine Co, Worcester, Ms.

Gear Cutting Machine.

Blaisdell, P, & Co, Worcester, Mass.
Whiton, The D. E, Co, New London, Conn.

Harness Varnish.

D. L. Witmer & Bro, 5th St. and Germantown Ave, Philadelphia.

Heating.

See Ventilating.

Heddles.

Watson, L. S, Mfg. Co, Leicester, Mass.

Hosiery Boards.

Pearson, J. T, Kensington, Pa.

Hose and Rubber Goods.

Boston Belting Co., 256 Devonshire St., Boston.

Ink, Stamping.

Witmer, D. L, & Bro, 5th St. and Germantown Ave, Philadelphia.

Insurance (Employers' Liability).

Employers' Liability Assurance Co, 28 Central St, Boston, Mass.

Knit Goods Edgings, Trimmings, etc.

Cheney Bros, Silk Goods, 479 Broome St, N. Y.
Friedberger & Co, Edgings, Germantown Phila, Pa.
Hepner & Horwitz, Lacings, 30 Howard St, N. Y.
Krout & Fite Mfg. Co, 2632 Mascher St, Phila.
Weimar Bros, 1817 East York St, Phila. Pa.

Knit Goods Finishing Machines, Crochet, Etc.

Excelsior Sewing Machine Co, 120 N. 7th St, Phila, Pa.
Merrow Machine Co, The, Hartford, Conn.
Nye & Tredick, 606 Arch St, Phila, Pa.
Scott & Williams, 2079 E. Cumberland St, Phila, Pa.

Knit Goods Brushers.

Ardrey, S. B, & Sons, Bristol, Pa
Jones, Lewis, Philadelphia, Pa.

Knitting Machine Cylinders.

Paxton & O'Neill, 129 Bread St, Phila, Pa.
Stafford & Holt, Little Falls, N. Y.

Knitting Machinery.
Boss Knitting Machine Works, Elm and Reed Sts., Reading, Pa.
Branson Machine Co., 506 John St., Philadelphia.
Brinton, H, & Co, 213 Race St, Phila, Pa.
Campbell & Clute, Cohoes, N. Y.
Cooper, Chas, Bennington, Vt.
Crane Mfg. Co, Lakeport, N. H.
Excelsior Knitting Machine Manufacturing Co., Allentown, Pa.
Hepworth & Co, Lehigh Ave. and Mascher St, Phila, Pa.
Jenckes, E. Mfg. Co, Pawtucket, R. I.
Jones, Lewis, 60 1-2 and Media Sts, Philadelphia, Pa.
Kennedy, Thos. (Cutters, etc.), Cohoes, N. Y.
Keystone Knitting Machine Mfg. Co, 40 No. 7th St, Philadelphia, Pa.
Lamb Mfg. Co., Chicopee Falls, Mass.
Leighton Machine Co, Manchester, N. H.
Little Hustler Napper Co., Hudson, N. Y.
Mayo Knitting Machine & Needle Co, Franklin, N. H.
McMichael & Wildman Mfg. Co, Norristown, Pa.
Mueller, A, 760 Lexington Ave, Brooklyn, N. Y.
Nye & Tredick, 606 Arch St, Phila, Pa.
Paxton & O'Neill, 127 Bread St, Phila, Pa.
Payne, G. W. & Co, Pawtucket, R. I. (Winders.)
Pepper Mfg. Co, Lakeport, N. H.
Scott & Williams, 2079 E. Cumberland St., Phila., Pa.
Stafford & Holt, Little Falls, N. Y.
Standard Machine Co., 508 Minor St., Philadelphia, Pa.
Taylor, James, 835 Arch St, Phila, Pa.

Knitting Needles and Supplies.
Breedon, Wm, & Son, Amsterdam, N. Y.
Cooper, Chas, Bennington, Vt.
Corey, Wm, Co, Manchester, N. H.
Crane Mfg. Co., Lakeport, N. H.
Dodge Needle Co., Manchester, N. H.
Goldstein, J. 416 Arch St., Philadelphia.
Ives, Loyal T, New Brunswick. N. J.
Keystone Knitting Machine Mfg. Co, 40 No. 7th St, Philadelphia, Pa.
Lydall, H, & Foulds, Manchester, Conn.
Manufacturers' Supplies Co., 66 No. 4th St., Philadelphia.
Mayo Knitting Machine & Needle Co, Franklin, N. H.
Page Needle Co, Chicopee Falls, Mass.
Treat, Orion, Manchester Green, Conn.
Wardwell Needle Co, Lakeport, N. H.

Laboratory Outfits.
Bullock & Crenshaw, 528 Arch St. Phila, Pa.

Lamps, Electric.
Beacon Lamp Co, New Brunswick, N. J.
Lynn Incandescent Lamp Co., Lynn, Mass.

Looms.
Crompton & Knowles Loom Works, Worcester, Mass.
Draper Company, Hopedale, Mass.
Fairmount Machine Works, 22d and Wood Sts. Philadelphia.
Furbush, M. A, & Son Co, Phila, Pa.
Howard, Geo. C., 1783 Barker St, Phila, Pa. (For wire.)
Kilburn, Lincoln & Co, Fall River, Mass.
Lowell Machine Shop, Lowell, Mass.
Mason Machine Works, Taunton, Mass.
Whitin Machine Works, Whitinsville, Ms,
Woonsocket Machine & Press Co, Woonsocket, R. I.

Loom Picker Manufacturers.
Crompton & Knowles Loom Works, Worcester, Mass.
Loom Picker Co, Biddeford, Me.

Lubricators.
Dixon, Jos, Crucible Co, Jersey City, N. J.

Lumber.
Stearns, A. T, Lumber Co, Neponset, Mass.

Lumpers.
Gerry, George, & Son, Athol, Mass.

Machinery Dealers.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.

Machinery Wipers.
American Silk Mfg. Co, 311 Walnut St Philadelphia, Pa.

Machinists' Tools.
Blaisdell, P, & Co, Worcester, Mass.
Whiton, The D. E. Co, New London, Conn.

Mails.
Walder, J, Paterson, N. J.

Measuring and Folding Machines.
Curtis & Marble Machine Co, Worcester, Ms.
Elliott & Hall, 54½ Hermon St, Worcester, Mass.

Mills For Sale.
Denny, R. B., 143 Federal St., Boston.

Mill Builders and Engineers.
Berlin Iron Bridge Co, The, East Berlin, Ct.
Ferguson, John W, Paterson, N. J.

Mill Supplies.
American Supply Co, Providence, R. I.
Bamford & Smith, Pascoag, R. I.
Bristol, The, Co., Waterbury, Conn
Buckley's, Benj. Son, Gun Mill, Paterson, N. J.
Douglas Manufacturing Co., Fall River, Mass.
Harwood, Geo. S, & Son, 53 State St, Boston.
Hill, Jas, Mfg. Co. Providence, R. I.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
Nashua Spool & Bobbin Co, Nashua, N. H.
Spofford, Wm. S, & Son, 5-11 Culver St, Providence, R. I.
Stevenson Bros. & Co, 132 So. 2d St, Philadelphia, Pa.
Thurston, A. G, & Son, Fall River, Mass.
Watson, L. S, Mfg. Co, Leicester, Mass.

Napping Machines.
American Napping Machine Co, Williamstown, Mass
Ardrey, S. B, & Sons, Bristol, Pa.
Curtis & Marble Machine Co, Worcester, Mass.
Jones, Lewis, 60 1-2 and Media Sts., Philadelphia, Pa.
Little Hustler Napping Co, Hudson, N. Y.
Woonsocket Napping Machine Co, Woonsocket, R. I.

Novelties.
Stohn, C, 178 Green St, Jamaica Plain, Mass.

Oilless Bearings.
N. American Metalline Co, 62 W. Ave. and 3rd St, Long Island City, N. Y.

Oil Filters.
Robertson, Jas. L, & Sons, 204 Fulton St, New York.

Pantagraphs for Mill Engraving.
Johnson, C. A, & Co, 22 Dey St, New York.

Patent Solicitors.
Crosby & Gregory, 34 School St, Boston, Mass.
Massink, H., Amsterdam, Holland.
Phillips & Anderson, 53 State St, Boston.
Wright, Brown & Quinby, 53 state St, Boston, Mass.

Penstocks.
Dalrymple, George, Fair Haven, Vt.

Perforated Copper
Beckley, A. J. & Co., Garwood, N. J.

Peroxide of Sodium.
Roessler & Hasslacher Chemical Co., 100 William St, New York.

Picker Sticks.
Loom Picker Co., Biddeford, Me.

Picking, Carbonizing and Garnetting.
Garfield Woolen Co, Garfield, N. J.
Kennebec Woolen Mills 2025 Naudain St., Philadelphia.

Pipe Covering (Magnesia).
Keasby, R. A. 54 Warren St, New York.
Keasby & Mattison Co. Ambler, Pa.
Nightingale, S. C, & Childs, Atlantic Ave, Boston, Mass.

Pneumatic Conveying.

See Ventilating.

Power Transmitting Machinery.

Channon, H, Co, 25 Market St, Chicago, Ill.
Eastern Machinery Co, New Haven, Conn.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Hunter, Jas, Machine Co, No. Adams, Mass.
Jones, W. A, 53-59 South Jefferson Street, Chicago, Ill.
Kilburn, Lincoln & Co, Fall River, Mass.
Link Belt Machinery Co, Chicago, Ill.

Presses.

Crawford, J. J, & Son, Nashua, N. H. (Power Screw, Hydraulic, Hollow Steam Plate.)
Curtis & Marble Machine Co, Worcester, Ms.
Hart, Charles, Frankford, Philadelphia.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Phillips Co, The Thomas, Providence, R. I
Pownall, F. H, Iron Works, Jamesburg, N. J.
Sullivan Machinery Co., Claremont, N. H.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Pressing Irons, Gas and Air Heated.

Sheftall, C. H, Mgr, 305-307 Mercer St, New York.

Pressure Regulators for Steam and Water.

D'Este & Seeley Co. (Curtis) 29 Haverhill St, Boston, Mass.

Printers and Embossers.

Novelty Textile Printing Co, 447-449 W. 14th St, New York.

Pumps.

Goulds Mfg. Co, Seneca Falls, N. Y.

Reed and Harness Manufacturers.

American Supply Co, Providence, R. I.
Loom Picker Co, Biddeford, Me.
Walder, J, Paterson, N. J.

Ribbons.

Cheney Bros, S. Manchester, Ct.

Roller Skins.

Fell, Geo, & Son, Bolton, England.

Roofing, Gravel, Slag and Composition.

Armitage Mfg. Co, Richmond, Va.
Johns, H. W., Mfg. Co., 100 William St. New York.
Warren Chemical & Mfg. Co, 45 Fulton St, New York.

Roofing, Paint and Paper.

Armitage Mfg. Co, Richmond, Va.

Roving Cans and Sheet Metal Work for Mills.

Hill, Jas, Mfg. Co, Providence, R. I.
Laminar, Fiore Co., No. Cambridge, Mass.
N. E. Ventilating & Heating Co, 930 Manton Ave. Providence, R. I.
Sullivan Machinery Co, Claremont, N. H.

Sample Cutters.

Gleason, A. H, Rockbottom, Mass.

Schools.

Gavey Correspondence School of Textile Design. P. O. Box 222, Brooklyn, N. Y.
Lowell Textile School, Lowell, Mass.
Philadelphia Textile School, Phila, Pa.

Sewing Machines and Supplies.

Curtis & Marble Machine Co, Worcester, Mass.
Frame, Gibbons, 2nd and Diamond Sts, Phila, Pa.
Manufacturers' Supplies Co., 66 No. 4th St., Philadelphia.
Nye & Tredick, 606 Arch St, Phila, Pa.
Scott & Williams, 6th and Arch Sts, Phila, Pa.

Shearing Machinery.

See Dyeing, Drying, Bleaching and Finishing.

Shell Rolls.

Cohoes Foundry & Mach. Co, Cohoes, N. Y.
Thurston, A. G, & Son, Box 528, Fall River, Mass.

Shoddies.

See Wool Shoddies.

Shuttles.

See Bobbins, Spools, Shuttles, Etc.

Silk Machinery.

Butterworth, H. W. Sons Co, Philadelphia.
Crompton & Knowles Loom Works, Worcester, Mass.

Singe Plates.

Butterworth, H. W. Sons Co., Philadelphia.
New Bedford Copper Co, New Bedford, Ms.

Sizing, Starch and Gums.

American Glutrose Works, Penn Mutual Bldg, Phila, Pa.
Columbia Mfg. Co, 143-151 Pocasset St, Fall River, Mass.
Stein, Hirsch & Co, 165 Duane St, New York.

Slashers.

Cohoes Foundry & Machine Co, Cohoes, N. Y.
Lowell Machine Shop, Lowell, Mass.
Phillips Co, The Thomas, Providence, R. I.

Soaps.

Holbrook Mfg. Co., 466 Washington St., N. Y.
India Alkali Works, Boston.

Spindles.

Buckley, Benj's, Sons, Gun Mill, Paterson, N. J.
Draper Company, Hopedale, Mass.
Ward & Vandegrift, Elmer, N. J.
Whitin Machine Wks, Whitinsville, Mass.

Spindle Tubes.

Bamford & Smith, Pascoag, R. I.

Spinning Cylinders.

Hill, Jas, Mfg. Co, Providence, R. I.
N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.

Spinning Frames.

See Cotton Machinery.

Spinning Frames for Wool

Woonsocket Machine and Press Co., Woonsocket, R. I.

Spinning Rings.

Draper Company, Hopedale, Mass.
Whitinsville Spinning Ring Co, Whitinsville, Mass.

Spinning Tubes.

Buckley, Benj's. Son, Gun Mill, Paterson, N. J.

Steam Boilers.

Brown, C. H, & Co, Fitchburg, Mass.

Steam Boiler Insurance.

Hartford Steam Boiler Inspection & Insurance Co, Hartford, Conn.
Mutual Boiler Insurance Co, 31 Milk St, Boston.

Steam Damper Regulators.

D'Este & Seeley Co, 29 Haverill St, Boston Mass.

Steam Engines.

Brown, C. H, & Co, Fitchburg, Mass.
Hooven (The), Owens & Reutschler Co, Hamilton, O.

Steam Separators.

D'Este & Seeley Co. (Curtis), 29 Haverill St., Boston.
Robertson, Jas. L, & Sons, 204 Fulton St, New York.

Steam Specialties.

Butterworth, H. W. Sons Co., Philadelphia.
D'Este & Seeley Co, 29 Haverhill St, Boston
Haines, W. S. C 136 South 4th St, Phila, Pa.
Robertson, Jas. L, & Sons, 204 Fulton St, New York.

Steam Traps.

D'Este & Seeley Co. (Curtis) 29 Haverhill St, Boston, Mass. (return float and expansion).
Haines, W. S. C 136 South 4th St, Phila, Pa.

Tanks, Tubs and Vats.
Caldwell Co., W. E. 202 Brook St., Louisville, Ky.
Challenge Wind Mill & Feed Mill Co, 195 High St, Boston, Mass.
Corcoran, A. J, 11 John St, New York.
Cypress Lumber Co, Apalachicola, Fla.
Stearns, A. T, Lumber Co, Neponset, Mass.
Woolford, George, 2240 No. 9th St, Phila, Pa

Tapes, Braids and Edgings.
Friedberger & Co, Germantown, Pa.
Goff, D. & Sons, Powtucket, R. I.
Krout & Fite Mfg. Co., 2632 40 Mascher St., Philadelphia.
Weimar Bros, 1817 East York St, Phila, Pa.
Young, Wm. M, 3638-40 Frankford Ave, Philadelphia, Pa.

Teasels.
Kellogg, Wm, W, Skaneateles, N. Y.

Temperature Regulators.
D'Este & Seeley Co, 29 Haverhill St, Boston.
Haines, W. S. C, 136 South 4th St, Phila, Pa.

Tentering Machines.
See Dyeing, Bleaching Machinery, Etc.

Tension Pulleys.
N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.

Testing Machines.
Howard, Geo. C., 1783 Barker St., Phila., Pa

Towers.
Caldwell Co., W. E. 202 Brook St., Louisville, Ky.
Challenge Wind Mill & Feed Mill Co, Boston, Mass.

Traveler's Cheques.
American Express Company.

Turbines.
(See Water Wheels.)

Valves.
D'Este & Seeley Co, 29 Haverhill St, boston Mass.

Ventilating Apparatus.
Allington & Curtis Mfg. Co, Saginaw, Mich., and East Cambridge, Mass.
Berry, A. Hun, 23 W. 1st St, Boston, Mass.
Massachusetts Fan Company, Room 641, 53 State St, Boston.
New England Ventilating & Heating Co, Providence, R. I.
Philadelphia Textile Machinery Co, Hancock St, above Lehigh Ave, Phila, Pa.
Sargent's, C. G., Sons, Graniteville, Mass.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass.

Washers (Cloth).
Hopkins, A, & Co, Bridgeton, R. I.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter, Jas, Machine Co, No. Adams, Mass.
Phillips Co, The Thomas, Providence, R. I.

Watches and Clocks.
Elgin, National Watch Co., Elgin, Ill.
Prentiss Clock Improvement Co, 49 Dey St, New York.

Watchman's Clock.
Eco Magneto Clock Co, 620 Atlantic Ave, Boston.
Nanz & Co, 116A Chambers St, New York.

Water Pressure Regulators.
D'Este & Seeley Co, 29 Haverhill St, Boston.

Water Wheels.
Bradway, C. P, West Stafford, Conn.
Christiana Machine Co, Christiana, Pa.
Humphrey Machine Co., Keene, N. H.
Hunt, Rodney, Machine Co, Orange, Mass.
Leffel, James, & Co, Springfield, O.

Water Wheel Governors.
Bradway, C. P, West Stafford, Ct.
Cohoes Foundry & Machine Co, Cohoes N. Y.
Leffel, James & Co, Springfield, Ohio.
Lombard Water Wheel Governor Co, 61 Hampshire St, Boston.

Winders. (Hosiery.)
Payne, G. W. & Co, Pawtucket, R. I.
Universal Winding Co, 226 Devonshire St, Boston.

Wood Pulleys.
Saginaw Manufacturing Co, Saginaw, Mich.

Wool.
Lyon, John H, & Co, 12 Reade St, N. Y.

Wool Cleaning Compound.
India Alkali Works, Boston.

Wool Combing Machinery.
Crabb, Wm, & Co, Newark, N. J.
Crompton & Knowles Loom Works, Worcester, Mass.
Townsend, Thomas, 157 Orange St, Providence, R. I.

Wool Extracts.
Garfield Woolen Co, Garfield, N. J.

Wool and Waste Dusters.
Gerry, Geo, & Son, Athol, Mass.
Sargents', C. G., Sons, Graniteville, Mass.
Stillman-Randall Machine Co, Westerly, R. I.

Woolen and Worsted Machinery.
Altemus, W. W, & Co, 2816 N. 4th St, Phila Pa.
Butterworth, H. W. Sons Co., Philadelphia.
Cobb, Thad. S., Machinery Co., Lowell, Mass.
Crompton & Knowles Loom Works, Worcester, Mass.
Curtis & Marble Machine Co, Worcester, Mass.
Fairmount Machine Works, 23d and Wood Sts, Philadelphia.
Furbush, M. A. & Son Machine Co, Phila, Pa.
Harwood, Geo. S, & Son, 53 State St, Boston.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter, Jas, Machine Co, No. Adams, Mass.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
Payne, G. W. & Co, Pawtucket, R. I.
Philadelphia Textile Machinery Co., Hancock and Somerset Sts., Philadelphia.
Phillips Co. The Thomas, Providence, R. I.
Sargent's, C. G., Sons, Graniteville, Mass.
Stoddard, Haserick, Richards & Co, Boston, Mass.
Woonsocket Machine & Press Co Woonsocket, R. I.
Woonsocket Napping Machine Co., Woonsocket, R. I.

Wool, Hair and Noils.
Becker, Chas. W, Agt, Amsterdam, N. Y.
Fowles & Co, 106 Church St, Phila.

Wool Shoddies.
Barnett, William, 164 Broadway, Albany N. Y.
Becker, Chas. W, Agt, Amsterdam, N. Y.
Garfield Woolen Co, Garfield, N. J.
Kennebec Woolen Mills, 2025 Naudain St, Philadelphia.
Riverdale Woolen Co, Riverdale, Northbridge, Mass.

Wool Sorters and Scourers.
Kennebec Woolen Mills, 2025 Naudain St, Philadelphia.

Wool Washing, Preparing and Drying Machinery.
Phillips Co, The Thomas, Providence, R. I.
Sargent's, C. G, Sons, Graniteville, Mass.

Yarns, Threads, Etc.

Banding.

Moore, C. & Co, 12 S. 5th St, Phila, Pa.
Warren, W, Thread Works, Westfield, Mass.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.
Tucker & Cook Mfg. Co, Conway, Mass.
Whittier Cotton Mills, Lowell, Mass.

Cotton Yarns.

American Spinners' Cotton Yarn Exchange, 226 Devonshire St, Boston.
Burnet & Co., 24 George Sq., Glasgow, Scotland.
Catlin & Co, New York and Boston.
Clark, Wm, Co, Westerly, R. I.
Cohannet Mills, Taunton, Mass.
Dana Warp Mill, Westbrook Me.
Eddy & Street, Providence, R. I.

Eichmann & Sternberg, 530 Broadway, cor. Spring St., N. Y.
Germantown Spinning Co, Germantown. Pa.
Grant Yarn Co, Fitchburg, Mass.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
Hadley Co, Holyoke, Mass.
Hawes, O. S, & Bro, Fall River, Mass.
Holland & Webb, 487 Broadway, N. Y.
Indian Orchard Co., Indian Orchard, Mass.
Jenckes, E., Mfg. Co., Pawtucket, R. I.
King, Alex, & Co, 54 Leonard St, New York City.
Mitchell, Jas. E, & Co, Boston and Phila, Pa.
Montgomery, J. R, Co, Windsor Locks, Ct.
Monument Mills, Housatonic, Mass.
New England Thread Co, Pawtucket, R. I.
Orswell Mills, Fitchburg, Mass.
Sanford Spinning Co, Fall River, Mass.
Tucker & Cook Mfg. Co, Conway, Mass.
Whittier Cotton Mills, Lowell, Mass.

Gassed Yarns.

Greene & Daniels Mfg. Co, Pawtucket, R. I.
King, Alex, & Co, 54 Leonard St, New York.

Glazed Yarns.

Eichmann & Sternberg, 530 Broadway, cor. Spring St., N. Y.
Indian Orchard Co., Indian Orchard, Mass.
King, Alex, & Co, 54 Leonard St, New York.
Malcolm Mills Co, Frankford, Pa.
Montgomery & Co, J. R, Windsor Locks, Ct.
Warren, W, Thread Works, Westfield, Mass.
Whittier Cotton Mills, Lowell, Mass.

Harness Twines.

Fawcett, Hughes, 115 Franklin St., N. Y.
Hadley Co, 95 Milk St, Boston, Mass.
King, Alex, & Co, 54 Leonard St, New York.
Moore, C., & Co., (S. W. cor. 5th and Market Sts.)
Warren, W, Thread Works, Westfield, Mass.
Whittier Cotton Mills, Lowell, Mass.

Hosiery and Knitting Yarns.

American Spinners' Cotton Yarn Exchange, 226 Devonshire St. Boston, Mass.
Boyer, B. F, & Co, Camden, N. J.
Campbell, Geo, & Co, Phila, Pa.
Clark, Wm. Co, Westerly, R. I.
Clasgens, The J. & H. Co, New Richmond, Ohio.
Cohannet Mills, Taunton, Mass.
Colchester Mills, 86-88 Franklin St, New York.
Eichmann & Sternberg, 530 Broadway, cor. Spring St , N. Y.
Germantown Spinning Co, Germantown, Pa.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
Holland & Webb, 478 Broadway, N. Y.
Hyde, E. S, 223 Chestnut St, Phila, Pa.
Jenckes, E., Manufacturing Co, Pawtucket, R. I.
King, Alex, & Co, 54 Leonard St, New York.
Mitchell, James E, & Co, Phila. and Boston
Monument Mills, Housatonic, Mass.
New England Thread Co, Pawtucket, R. I.
Orswell Mills, Fitchburg, Mass.
Rockwell, E. M, Leominster, Mass.
Sanford Spinning Co, Fall River, Mass.
Shimer, Geo, & Son, 5th and Erie Sts, Camden, N. J.
Skerry, A T, & Co, 47 Leonard St, N. Y.
Walcott & Campbell Spinning Co, New York Mills, Oneida Co, N. Y.
Warren, W, Thread Works, Westfield, Mass.
Whittier Cotton Mills, Lowell, Mass.

Flax, Hemp, Jute and Ramie.

Burnet & Co., 24 George Sq., Glasgow, Scotland.
Eichman & Sternberg, 530 Broadway, cor. Spring St., N. Y.
Fawcett, Hughes, 115 Franklin St., N. Y.
Holland & Webb, N. Y.

Mohair Yarns.

Eichmann & Sternberg, 530 Broadway, cor. Spring St., N. Y.
Goff, D. & Sons, Pawtucket, R. I.
Holland & Webb, New York.
Skerry, A. T, & Co, 47 Leonard St, N. Y.

Novelty Yarns, Tinsels, Silk Noils, Etc.

Burnet & Co., 24 George Sq. Glasgow, Scotland.
Cranston Worsted Mills, Bristol, R. I
Eichmann & Sternberg, New York City.
Holland & Webb, New York.
Indian Orchard Co., Indian Orchard, Mass.
Malcolm Mills Co, 229 Chestnut St, Phila, Pa.
Montgomery & Co, J. R, Windsor Locks, Ct.
Skerry, A. T, & Co, 47 Leonard St, N. Y.

Silk Yarns.

Cheney Bros, S. Manchester and Hartford Ct.
Eddy & Street, Providence, R. I.
Eichmann & Sternberg, 530 Broadway, cor. Spring St., N. Y.
Hawes, O. S, & Bro, Fall River, Mass.
Holland & Webb, 487 Broadway, N. Y.
Ryle, Wm, & Co, 54 Howard St, N. Y.

Woolen and Merino Yarns.

Boyer, B. F, & Co, 516 Market St, Philadelphia, Pa.
Clasgens, The J. & H. Co, New Richmond, Ohio.
Eddy & Street, Providence, R. I.
Hyde, E. S, 223 Chestnut St, Phila, Pa.
Jenckes, E. Mfg. Co., Pawtucket, R. I.
King, Alexander & Co, 54 Leonard St, N. Y.
Rockwell, Edward M, Leominster, Mass.
Skerry, A. T, & Co, 47 Leonard St, N. Y.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.

Worsted Yarns.

Alleghany Worsted Mills, Phila, Pa.
Botany Worsted Mills, Passaic, N. J.
Boyer, B. F, & Co, 516 Market St, Philadelphia, Pa.
Campbell, Geo, & Co, Phila, Pa.
Cranston Worsted Mills, Bristol, R. I.
Croft, Howland, & Sons, cor. Broadway and Jefferson Ave., Camden, N. J.
Eichmann & Sternberg, 530 Broadway, cor. Spring St., N. Y.
Elasser, Albert R, Addingham, Pa.
Goff, D. & Sons, Pawtucket, R. I.
Herbst & Jones, 21st and Naudain Sts, Philadelphia, Pa.
King, Alexander & Co, 54 Leonard St, N. Y.
Phoenix Mills Co, 13 Letitia St, Phila, Pa.
Shimer, Geo, & Son, 5th and Erie Sts, Camden, N. J.
Skerry, A. T, & Co, 47 Leonard St, N. Y.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.

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SITUATIONS WANTED.

The advertisers in the following columns should be addressed in care of TEXTILE WORLD, or inquiries concerning them may be addressed directly to "Information Department, TEXTILE WORLD," as full particulars of each advertiser are on file, and the addresses of suitable agents, superintendents and foremen for every branch of the textile industry will be furnished to manufacturers.

Any subscriber may file his application, and no charge is made until position is secured.

The business of this department is held strictly confidential.

The applications of good overseers in every department, who are in want of positions, are solicited.

Manufacturers are invited to use this department when in need of skilled men; each case will be handled confidentially, with promptness and judgment, and without charge to manufacturers.

A member of the firm is in charge of this department, and gives personal attention to each case.

WOOLEN SUPERINTENDENTS.

1349 **Woolen Supt. or designer.** Has been 12 years superintendent of 20 set mill in Conn., until recently, when he resigned on account of children's schooling. Has also been designer and pattern weaver. High character and first-class ability. Age 39; American, married. Experience on worsteds, cassimeres, cheviots, ladies' fancy dress goods, etc.

1387 **Woolen Superintendent,** one who has had a thorough practical experience in setting up and operating woolen mills. Would take charge of small mill or finishing department in large mill. Now employed but wishes to change. Correspondence solicited.

1258 **Woolen** Superintendent, Carder, Spinner or Weaver. Has experience in dyeing. Is a reliable man. 40 years old. Refers to responsible parties as to character and ability.

1398 **Woolen Superintendent or Designer** of recognized ability and at present employed as a superintendent of a 4 set woolen and worsted mill. He finds it necessary to remove from New Jersey on account of his wife's health. His past record is first-class and this is an unusual opportunity to secure the services of a first-class superintendent.

1386 **Woolen Superintendent and** Expert Carder. With experience in both positions. A man of skill and push, now out of work through failure of mill, caused by outside speculation by one of the firm. Age 43; married; Yankee.

1268 **Woolen** superintendent or designer. First-class experience in England and America. A first-class man in every way; age 34; married. Fancy worsteds, cheviots, novelty goods, cassimeres, overcoatings, cloakings, dress goods, piece dyes, worsteds and cheviots.

1305 **Superintendent and Designer** with 20 years' experience in woolen mills, on cassimeres, cheviots, worsteds and cloakings. Is now out of employment. Wants position at once.

1255 **Felts.** The advertiser has a thorough, practical knowledge of all the details connected with the manufacture of paper makers' felts and jackets; especially adapted for fast running machines; good reason why he is now in the market; recommended by past employers.

1250 **Superintendent,** or would accept a position as designer in a good woolen mill. Understands fancy cassimeres, cloakings, dress goods, kerseys, unions and worsteds. Can produce the Jacquard effect on an ordinary cotton, Knowles loom. Refers to good mills.

COTTON SUPERINTENDENTS.

1337 **Assistant Superintendent.** Expert on book binder's cloth, window shades, fan cloths, friction callender machines. 20 years with Wilson & Bentleys, London, and about 2 years employed in this country. Age 45, married. American and English references.

1332 **Supt. with long experience** in both Northern and Southern mills. Has started 3 Southern mills, on print cloths, broad and narrow sheetings and fine shirtings. First class references from all past positions. Age 48. Might accept position as overseer of large weave room.

1265 **Superintendent** wants position as superintendent of cotton cloth mill. Has had charge of each department in the mill; aged 28 years; married.

1266 **Cotton** superintendent wants position. Out on account of mill shutting down. Understands fancy and plain cottons, white and colored. Has a first-class record.

1267 **Cotton** superintendent or carder. Prints, sheetings, ginghams, fine and coarse, white and colored. Nearly all kinds of machinery. References all right. Age 47; married.

1227 **A Superintendent** with a thorough practical training in all the departments of a woolen mill making worsted cassimeres, dress goods, cloakings, overcoatings, robes, blankets, shawls, etc. Has a thorough knowledge of designing and has held position in first class mill, to which he can refer.

1306 Young American wants position as cotton superintendent. Experience mostly on cotton warps. Has been bookkeeper, overseer of carding and spinning; also superintendent in Massachusetts mills.

1184 **Cotton Mill Superintendent,** wants position. Age 50; married. Sheetings, shirtings, drills, etc.; also all kinds of yarns and yarn dyeing. Has good references. Superintendent eighteen years at one mill.

578 **Cotton Superintendent** with experience as boss carder, master mechanic and superintendent on prints, sheetings, twills and sateens. An American of high character, and whose ability is proved by past record. Age 35, married; can accept position at once.

1390 **Cotton Superintendent.** Especially qualified for a mill making dress goods and fine shirtings. Experience with first-class mills as designer and manager. A young man of high character. At present employed.

1269 **Cotton** superintendent, carder, spinner and dresser; 43; married. Has held position in some of the best mills; is strictly temperate, and well recommended. Cotton, flannels, ginghams, crochet and Marseilles quilts, etc.

WOOLEN CARDERS.

1241 **Woolen Carder.** Age 40; married. Overseer 14 years in one place. Long experience on all-wool, wool and cotton mixed, shoddy, etc. Temperate, and can furnish good references. Prefers Philadelphia.

1082 **Woolen carder experienced on** all classes of underwear. Has worked for eight years in one mill, 29 years of age and married. Good references.

1190 **Woolen** Carder or Spinner. Age 47; married. One reeler and one piecer in family. Has been overseer and spinner for the last fifteen years for one firm, which is now out of business. Refers to past employers. Can take position at once. Familiar with wool shoddy and cotton; Furbush, Lee and other makes of machinery.

1378 **Overseer Woolen Carding.** American, age 32, married. With one mill 13 years, and another 4 years. Excellent references from each. A first-class carder in every way.

1367 **Boss Carder** of wool, shoddy, or cotton. More than 12 years experience as boss carder in leading knitting mills in N. Y. At present employed but desires to change for $3 00 a day or better. Can take charge of mule spinning also. Married; age 36; American.

1286 First-class Carder, now employed, wishes a better position. Has the best of references from good mills. Excellent manager of help. Age 35; married. Experience on broadcloth, dress goods, covert cloth and meltons.

1270 **A 1 Carder,** wool or cotton, 11 years experience, first-class references, reliable, temperate and industrious, desires immediate position. Age 30. Will go any where.

1307 **Carder** with unusually fine record and very wide experience desires good position in New England, Central or Western States. First-class references from past positions. Age 44. Experience on cassimeres, cheviots, dress goods, broad-cloth, repellants and blankets.

COTTON CARDERS.

1339 **Cotton Carder,** young man holding first-class position in New York State, would like position in Eastern or Middle States as assistant superintendent or boss carder paying $5.00 or more a day. Is worth that salary; experience and references of the best.

1368 **Overseer on Second-Hand Cotton** Carding wants a position in small room at $2.50 per day or upwards. Will do his own grinding. Or, would take a first-class second hand job. Last five years in one place. Thoroughly practical and understands all the machinery in the card room. Age 37; married. Good reference. Prefers New England.

1384 **Second Cotton Carder.** Energetic student at Lowell Textile School wants position in a mill until Oct. 1st 1898. Only expects enough pay to cover living expenses. A bright young man not afraid of hard work.

1315 **Cotton Carder.** Over 20 years' experience as overseer in first class mills. At present employed. Well up on prints and light and heavy sheetings. Knows American and English cards, and speeders. Best references.

WOOLEN SPINNERS.

1299 Woolen Spinner who has had experience as second-hand would like a position as boss spinner. Would accept small salary to start. Has worked on cloakings, dress goods and Scotch tweeds in New England mill.

1287 **Young Man** wants position as boss spinner. Experience in first-class mills on cassimeres, kerseys, cheviots, satinets; knows Davis & Furber, Paul and Johnson & Bassett machines. Age 29. Wife works in mill.

1195 **Spinner, Woolen.** American; age 31; married. Experienced on yarns from 1 to 7 1-2 run. Refers to past and present employers. Wants position as overseer. Will not go to Southern States, Canada or Connecticut. Is an experienced overseer.

1374 **Overseer Woolen Spinning.** All makes of mules, has had charge in good mills. Experience covers yarns for hosiery, fancy woolens and worsteds. Age 28; married.

633 **Woolen Mule Spinner** desires to move from Maine on account of wife's health. At present in good position. Age 37; married, Scotchman.

1204 **Situation wanted** as boss spinner, or second hand and mule fixer on Platt mules. Many years experience on yarns for dress goods in England, and also yarns for fine woolen cloth. 35 years old and married; good references.

1316 **Overseer Worsted Drawing** and spinning. Will accept first class position at $3 or more per day. At present employed in well known and first class mill. Age 42. Married. Best references from former employers.

COTTON SPINNERS.

1284 **Eleven years as Overseer** in first-class gingham mill, with other experience, has fitted this man for good position in charge of ring spinning, spooling and warping. Age 40. French American; married.

1272 **Second Hand** of cotton ring spinning wants position in Massachusetts, Rhode Island, Maine or New York. Age 23; married.

1364 **Cotton Spinner, mules or frames** Early training in England, 5 years in New England mills, yarn 20s to 120s. Because of misfortune would accept second hand job. Excellent reference for character and ability. Age 32, married

1350 **First-Class Ring Spinning** overseer, also spooling, warping, slashing, web drawing; large experience, highest references as to skill, character and executive ability. At present employed in Fall River. Age 48, American.

1198 **Cotton Spinner,** spooling, warping, slashing, web drawing, skein winding and quilting on linen. Well recommended. Age 42; married. Has worked in some of the best mills. Will go anywhere. Would accept a good second hand's position.

1370 **Overseer Cotton Ring Spinning** At present second hand in a large Maine mill. 12 years experience in spinning. Age 34; not married. High references from past and present employers.

WOOLEN WEAVERS.

1340 **Worsted Weaver** would like position in a small mill at moderate salary; experience as fixer and in cloth room. Age 38, married. Knowles and Crompton looms; references good.

1130 **Overseer of Woolen Weaving** wants position. Would accept 2nd hand's position in a good mill. American; protestant; age 36; single. Good man on Knowles fancy and plain looms, also Davis & Furber. Cassimeres, worsteds, meltons and flannels. Will not go South, West or Pennsylvania.

1099 **Woolen Weaver** on dress goods, cassimeres, unions and worsteds. At present out of work because of mill shutting down. Has an excellent record and refers to well-known men. Willing to start on moderate wages. Age 41; married.

1385 **Worsted or Woolen Weaver** of fancy worsted and woolen mens' wear and novelty dress goods. Has held positions in leading N. E. and Phila. mills. Expert on Crompton & Knowles looms: Best references. Age 38; married. Can start at once.

1313 **Woolen Weaver.** First class references, and experience on fancy cassimeres, kerseys, beavers, dress goods, etc. At present not employed, for good reasons. Age 44. Married.

140 **Worsted Weaving Overseer** with 12 years' experience as overseer, designer, and superintendent. Has tried another business for a few months and now wants to go back to the mill. Excellent references, habits all right. A skillful weaver and manager. Age 33, married, American.

COTTON WEAVERS.

1380 **Overseer Cotton Weaving.** Held overseer's position for 5 years in Mass. mill, but now out because of change in management. A man of well-known ability. Age 48; married, American. One of the best weavers in New England. Will go South to a good position.

1373 **Overseer Cotton Weaving.** A man with especially good opportunities to gain wide experience in large Mass. mills; now second hand, having worked up from band boy. American, age 29, married; best of references.

1392 **Cotton Weaver,** with first-class record in R. I. mills, desires to change for position paying $2.50 or more. Experienced on sheetings, lawns, sateens, twills, etc. Excellent references. Age 35, married.

1353 **Overseer Cotton Weaving,** who has worked up from fixer to overseer in good mills, wants position paying $3.00 or more. Scotch, age 29; experience on all kinds sheetings and sateens.

1334 **Jacquard and Dobby Weaver** and designer on Knowles machines. 8 years' experience in this position. At present employed and can furnish excellent references. Age 38; married.

1333 **Overseer of Cotton Weaving** with more than 20 years' experience in weave rooms of N. E. and Canadian mills. Experience on all kinds of white and colored, plain and fancy work, except Jacquard, American and English, looms. Married; age 37.

1247 **Elastic** weaver wants position as overseer. Used to cotton web, elastic suspenders, silk neckwear, dress goods and handkerchiefs. 28.

DYERS.

1354 **Dyer of Large Experience** both in woolen mills and in job dyehouses. A man of far more than average skill from raw stock to piece dyeing, dress goods, etc. Scotch, married; age 39.

1355 **Wool and worsted Dyer,** a young man with 5 years' training by one of the best dyers at one of the largest mills in N. E. Experience on worsted and woolen cheviots, clays, worsteds, suitings, cloakings, beavers, dress goods, carriage cloths, yarn, slubbing, wool. Would be able to take charge of small high grade small plant.

1360 **Wool Dyer or Assistant,** 6 years' training as assistant on shoddy and wool piece dyeing. French American, age 24, single, well recommended.

1361 **Wool Dyer and Finisher,** large experience on blankets, all kinds of flannels, felts and dress goods. Early training in Scotland, 15 years in this country. Now employed, but wants to locate in the North near the sea. Age 40, married; now giving entire satisfaction.

1382 **Cotton Piece Dyer.** 12 years at last place. Experienced in all kinds of cotton goods. Englishman, age 37, married. Well recommended for character and ability.

1393 **Knit Goods Dyer** who has had 18 yrs. experience in first-class mills, desires to make a change. Is capable of taking the management of a cotton underwear mill. Best of references. Age 42; married, American.

1377 **Woolen Dyer** with experience on a great variety of goods, including raw wool, yarns, carriage cloth, satinets, kerseys, beavers, repellents, men's suitings; well recommended. Would start at $2.50 a day. Age 32; married.

FINISHERS.

1351 **Woolen and Worsted Finisher** with 7 years' experience as overseer in R. I. and N. Y. mills, from which he has excellent references. At present second hand in one of the best worsted mills in N. E. Habits first-class; age 29, married.

1359 **Woolen Finisher** of all kinds of woolen goods; 20 years in charge, at three leading mills. At present out of employment; expects $4.00 a day. Age 45, married; references first class.

1041 **Woolen Finisher.** Has had experience on fancy and piece dyed goods, cassmeretes, cheviots, worsteds, kerseys and dress goods. Wants position as overseer or second hand in New England States. Age 26 years. Will work for $2.50 per day.

1330 **Expert Finisher** with 10 years' experience in European mills. Can do perfect work on highest grade cassimeres, serges, cheviots, kerseys, worsteds, astrachans. Age 34; married. German, speaks English imperfectly.

1376 **Finisher** of all grades of woolens and worsteds, wet or dry. 8 years experience in England and 6 years in this country. Now employed as overseer but wants to change location. Age 30; married.

1396 **Wool Finisher.** This man has had a very large experience among well-known mills and refers to past employers. Character and ability of the first order.

KNITTERS.

1274 A man who thoroughly understands the manufacture of hosiery from the fleece to the case, and is a good manager. Desires to correspond with parties wishing to employ such a man.

1362 **Boss Rib Knitter,** young man, now second hand in fleece lined underwear mill in New York State wants to advance. Very highly spoken of by present employers as to both ability and character. Could change on short notice.

1317 **Knitting Overseer.** Wide experience. Age 36. Married. Has worked on fleece lined underwear, eider downs, stockinet, jerseys, etc. Familiar with spring needle circular machines First class references.

1342 **Hosiery or Underwear Supt.** A practical knitter familiar with latch, spring needle, and sewing machines; nearly 15 years superintendent of New England hosiery mill, at present shut down. Good manager; references first-class. Age 47; married.

1389 **Knitting Machine Fixer.** Early training as general machinist. Was for several years with Philadelphia mills on underwear, mittens, etc. Very reliable, age 31; not married, American.

1391 **Boss Knitter** who has the very best references. Now employed but wants more pay. Would change for $3.50 a day. Experienced in both hosiery and underwear Age 32; married, American.

1371 **Cotton Hosiery Supt.** Has had charge of hosiery mill in N. C. Would like a western mill. Refers to last position. Young man, not married.

DESIGNERS.

1275 **Designer** or assistant. Age 25; married. A good man on cotton or worsted fancy dress goods. Jacquard and box looms.

1263 **Assistant** Designer or Assistant Superintendent. Has received a practical mill experience, and is a graduate of the Philadelphia Textile School. Unions, cassimeres, suiting, cloakings. Age 24 years.

1252 **Designer, Weaver or Dresser.** Aged 40 years; married. Familiar with nearly all kinds of men's wear, piece dyes, etc. Refers to past and present employers.

1259 **Woolen Designer or Supt.,** 10 years' experience on meltons, kerseys, beavers, and dress goods. Thorough knowledge of color mixing and picking out. Best of references from past positions. Age 39, single.

1397 **Cotton Designer or Weaver.** A young man with unusual opportunities and experience in England, now holding a position in a leading mill in Connecticut, desires to advance. Refers to several prominent mill men and would make a progressive designer for a mill running on Jacquards, Lappet or Lenos.

1383 **English Woolen Designer.** 20 years in leading Yorkshire and Huddersfield mills as designer, supt. and weaver. Very large experience and would accept moderate salary in good mill. Age 36; married, English.

9999 **Superintendent Print Works.** Young man, 30 years of age, energetic and practical, graduate chemist, with thorough experience in printing, especially of silk (2 years in Europe and 4 in this country), seeks position as superintendent or assistant in print works. Address Chemist, care TEXTILE WORLD.

MISCELLANEOUS.

1365 **Assistant Supt. Underwear Mill.** Experience mostly on flat goods, is an expert bookkeeper, understands making cheap goods, finishing, and general knowledge of machinery. Moderate salary. Age 39, married, American.

1301 **Book-keeper and Paymaster.** Young man of the very highest character desires to move away from the Atlantic coast, on account of his health. Best references from his present and former employers.

1393 **Practical Chemist.** Experience covers three years in English and German textile schools and 17 years in New England mills, bleacheries and print works. Has practical knowledge of all departments of a bleachery, and would accept position in the South. Age 39; married; American.

1381 **Cloth Examiner.** Worsteds or woolens. German, age 50, single. Man of high character, 9 years in one of the leading N. E. mills and also in large N. Y. clothing houses. Best of references.

1395 **Overseer of Slashing, Spooling,** warping and dressing, a man who thoroughly understands his business and has excellent habits, well recommended from leading mills. Age 42; married, English.

1379 **Overseer, Cloth Room.** Out of work because of change in management. A man with first-class record and wide experience. Refers to several prominent mill men. Age 39; married, American.

1375 **Machinist.** Practical man who has worked on cotton machinery for many years and has excellent references. American, age 29; married. Can start work at once at $2.25 a day.

1336 **Beaming and Slashing.** Experience in Mass. and Me. cotton mills on ginghams, dress goods and all kinds colored goods. Age 30; habits first-class, good references. At present employed in large mill.

1335 **Loom Fixer or Second Hand.** Knowles and Crompton looms, fancy worsteds and cassimeres, dress goods. German; Protestant; age 37, married. Has been employed in good mills and is very well recommended.

1372 **Wool Sorter.** Young man with excellent training in R. I. mill. Will start at $2.00 a day. Refers to past employers.

1312 **Overseer Dresser.** Age 34. Married. Is at present working in a first class mill. Desires to change because of poor health of family. Can furnish first class references. Cassimeres, unions, woolens.

1363 **Twisting, Spooling, Warping** overseer. Experience on single and twisted yarns up to 2/100s in one of the best New England mills. Now employed as assistant; young man, but is confident that he could satisfactorily fill overseer position.

1356 **Second Hand Cotton Spooling,** warping, twisting, slashing, or could handle overseer position in small mill. Well recommended, now with good mill.

1202 **Silk Superintendent** is open for an engagement with a first-class company. Has a thorough knowledge of all the details connected with the manufacturing of silk ribbons and hat bands, from throwing to the finished product. Has held the position of superintendent of a first-class mill for several years. Under 30 years of age, and married. Has the best of references. For any further information address this paper.

TEXTILE BOOKS.

The following are recent publications, which we will furnish upon receipt of their price.

Plain Series of Cotton Spinning Calculations, by William H. Cook, 91 pages.

This book gives original calculations relating to cotton spinning, giving the position of the different pulleys and wheels, which are taken into consideration when making calculations; and also points where the necessary changes are made when altering from one count to another. Price $1.

The Student's Hand-Book of Practical Fabric Structure, by H. Neville. 8vo., 235 pages.

The object of this work is to interest the student in the subject of weaving by a series of consecutive lessons in the principles of fabric structure. Free use is made of sectional diagrams, to show what actually takes place in producing any particular fabric. An idea may be had of the nature of the book from the following partial enumeration of the subjects treated: Design Paper and Its Uses; Plain Cloth and Its Ornamentation, Twilling, Drafts and Tie-ups; Spotting; Open-work Effects; Cords; Pile Weaving; Cross Weaving; and Backed and Double Cloth. Price $2.25.

The Printing of Textile Fabrics, by C. F Seymour Rothwell. 8vo., 312 pages.

This is a practical manual on the printing of cotton, wool, silk, and half-silk fabrics, with plates, illustrations in the text, and specimens of printed fabrics. The work contains but little information of a purely chemical or theoretical character, as it has been covered by the "Manual of Dyeing," by Knecht, and others. The author has confined himself more to the practical side of the subject, and the processes and machinery described by him are principally those with which he has had practical experience. Price $6.50.

Cotton Spinning, by W. S. Taggart

Two volumes of this work have been issued; the second volume brings cotton spinning down to the end of what is generally termed the preparing processes and includes all of the machinery and manipulations between the card and the self-actor, or ring frame. This work is esteemed of much assistance to the student. Price $1.75.

Ornamental Design for Woven Fabrics, by Stephenson & Suddards. 273 pages, 66 illustrations.

This is a text book dealing with ornamental design for woven fabrics, for the use of the student, and has been written for the purpose of suggesting helpful ideas to designers and manufacturers of textiles, and aims at bringing artistic textile work into practical touch and closer relationship with the technical requirements of manufacturing. It takes up such subjects as Geometric Design; How to Plan an All-over Repeating Design; The Drop Pattern; The Sateen Arrangements; Borders, Corners, Stripes; The Structure of Ornamental Flowers, Foliage, etc. Price $2.50.

The Power Loom, by Alexander Brown.

This is a practical, well written treatise of 118 pages, on the construction of the power loom and the art of weaving, giving descriptions of the texture produced by different numbers of harnesses. The text is illustrated with diagrams, and contains calculations and instructions for the production of cotton, woolen, linen and jute fabrics. It was written with the intention of serving as a text book for those engaged in the trade. Notwithstanding it relates to English machinery, it is of value to those operating that of American make. Price $1.25.

Jacquard Weaving and Designing, by T. F. Bell. 300 pages. Fully illustrated.

The contents of this work have been derived from a long course of art and technical training, together with a lengthy practical experience in textile manufacturing and designing, by the author. The descriptions are as concise as is compatible with fairly clear explanation. Price $3.00.

Cotton Weaving and Designing, by John R. Taylor, 288 pages, fully illustrated.

This work is by a well known writer and lecturer on this subject, and treats of such topics as: Hand and Power Looms; Drop and Circular Box Looms; Dobbies; Jacquard and Leno Weaving; Terry Looms; Principles of Designing, Plain and Figured; and Textile Calculations. This work is of much value. Price $2.50.

Woolen Spinning, by Charles Vickerman.

This is a most excellent work for students in textile schools, and for skillful, practical men in woolen mills. It takes up the principles that underlie the various processes and operations of the earlier parts of manufacture. It has chapters devoted to Wool; Wool Sorting; Scouring; Bleaching; Mixing, etc., Carding and Spinning. 352 pages. Price $1.75.

The Student's Cotton Spinning, by Joseph Nasmith.

This is a standard book on spinning. It treats of mixing, opening, scutching, carding, card clothing, combing, roving, spinning, reeling, waste spinning, etc. 593 pages. Price $2.50.

Technology of Textile Design, by E. A. Posselt.

As a practical treatise on the construction and application of weaves, and the analysis of cloth, this is, in very many respects, the best work for the American manufacturer that is published. Price $5.00.

The Mechanism of Weaving, by T. W. Fox.

A treatise of 464 pages, presenting exact and practical information upon the principles of weaving. Takes up such topics as Harnesses; Shedding; Dobbies; Jacquards; Card Cutting; Picking; Pickers; Swivel Weaving; Beating Up; The Reed; Taking-up Motion; Temples; Trimming and Fixing of Parts. 256 illustrations. Price $2.50.

Manual of Dyeing, by Knecht, Rawson and Loewenthal. In three volumes.

Decidedly the best work of the kind for a proper understanding of the present state of the art of dyeing, for the use of practical dyers, manufacturers and students. It takes up such subjects as, Water; Acids; Alkalies; Mordants; Natural and Artificial Coloring Matter; Machinery used for dyeing, etc. Has numerous illustrations and specimens of dyed fabrics. Price $15.00.

Patents.

(Continued from page 22.)

Knitting Machine Sinker Top. Hosiery. 606,094. H. H. Skevington and W. L. Whitehead, Philadelphia, Pa.

Knitting Machine Thread Changer. 606,029. J, E. Rowe, Pawtucket, R. I, assignor to E. Jenckes Manufacturing Co., same place.

Knitting Machine. Yarn Changing device for rib. 604,640 R. W. Scott, Philadelphia, Pa., assignor of one half to L. N. D. Williams, Ashbourne Pa.

Lappet Shearing Mechanism. 604,772. E. T. and E. H. Marble, Worcester, Mass.

Loom. 605,603. A. D. Emery, Taunton, Mass., assignor to Universal Loom Co., New York.

Loom. 605,019. J. W. Sherry, Providence, R. I., assignor to Crompton Co., same place.

Looms. Fringe-making Attachment for hammock. 605,971. I. E. Palmer, Middletown, Conn.

Loom Frame, Carpet. 605,507. C. N. Newcomb, Davenport, Iowa.

Loom Picker Check. 605,581. W. Lonzo, Fitchburg, Mass.

Loom Picking Mechanism. 604,897. G. Goodline, Patterson, N. J., and J. A. Clark, Worcester, Mass., assignors to Crompton & Knowles Loom Works, Worcester, Mass.

Loom Shedding Mechanism. 605,825. G. F. Hutchins, Worcester, Mass., assignor to Crompton & Knowles Loom Works, same place.

Loom Shuttle. 604,804. L. Sturges, Chicago, Ill.

Loom Shuttle. Self Threading. 605,690, M. H. Leveille, Worcester, Mass., assignor of one half to J. G. Smith, same place.

Loom Shuttle Stop Motion. 605,692. A. D. Emery, Taunton, Mass., assignor to Universal Loom Co., New York.

Loom Shuttle Box-operating Mechanism. 604,669 G. Schwabe, Biala. Austria Hungary.

Loom Slack Alarm and Stop Motion. 605,199. J. and J. Harriman, Lowell, Mass., said J. Harriman assignor to Josiah Harriman.

Loom Thread Cutting Temple. 604,632 J. H. Northrop, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass., and Portland, Me.

Loom Warp Stop Motion. 605,600. A D. Emery, Taunton, Mass., assignor to Universal Loom Co., New York.

Loom Warp Stop Motion. Narrow ware. 605,479. J. Harriman, Lowell, Mass.

Loom Welt Stop Motion. 605,601 A. D. Emery, Taunton, Mass., assignor to Universal Loom Co., New York.

Pile Fabrics, Apparatus for Cutting double. 604,701. R. Richter, Reichenberg, Austria-Hungary.

Plush Fabric. 605,710. G. B. Goodall, Sanford, Me.

Spindles, Doffer-guard and Stopper for lubricating tubes for. 604,446. J. W. Wattles, Canton, Mass.

Spindle Bearing. 605,703. G. O. Draper, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass., and Portland, Me.

Spinning Machine. Wool. 605,203. W. W. New, Morrellville, Ill.

Spinning-mule Yarn Guide. 604,563. J. D. White, Urmston, assignor of one-fourth to H. S. Golland, Worsley, England.

Warp Threads, Machine for Unwinding. 605,965. Z. H. Mangum. Chester, S. C.

Wool Dryer. 605,025. J. W. Spencer, Providence, R I.

Wool Washing Machine Bucker. 605,653. F. G. Sargent, Graniteville, Mass.

Woven Fabric. 605,783. A. Heald, Philadelphia, Pa.

Yarn Guide, Tension and Clearer. 605,918. P. B Sanford, Fall River, Mass.

Facts and Gossip.

—Province of Quhec, Sherbrooke. The Sherbrooke Yarn & Woolen Mills were destroyed by fire June 16. It is understood that the property was insured for $14,000, which probably will cover the amount of the loss.

—Rhode Island, Lymansville. It is reported that the Lymansville Co., which started its mill June 6th, will continue to run on full time. Isaac Middlebrook is now superintendent and Andrew Brunside has succeeded Mr. Middlebrook as foreman of the spinning department.

—Rhode Island, Manton. The Manton Mills, H. A. Kimball proprietors, are now operating the carding and shipping departments day and night, having received large orders.

—South Carolina, Charleston. The Charleston Mills' stockholders, at a recent meeting, considered arrangement for issuing more bonds. When the company was started it was intended that the paid in capital should be $350,000. Only $223,000 was received, however, and the balance of $127,000 is now needed to put the finances on a proper footing. It is reported that the company's experiment with negro labor has been satisfactory.

—Virginia, Beuna Vista. The Beuna Vista Cassimere Mills are now running day and night on cloth for army uniforms. This property was purchased last autumn by Philadelphia parties, and it is reported that they now contemplate enlarging.

—Vermont, Bennington. At the knitting mill of H. E. Bradford & Co., B. A. Fryer, of Mohawk, N. Y., is now superintendent, having taken the place of L. F. Abbott, formerly one of the proprietors. It is understood that the mill will be enlarged and new machinery added.

—Vermont, Springfield. W. H. H. Slack & Bro., shoddy manufacturers, have purchased the four-story mill formerly operated by the Black River Woolen Co.

—Virginia, Petersburg. The Swift Creek Cotton Mills, which were recently sold to E. A. Hartley for $5500, will be soon put in operation, provided the court confirms the sale.

Rib Knitter.

Competent, reliable man of experience on rib and other flat knitting machines, desires position. References. Addre.s, "H," 231 Lawrence St., Hartford, Conn.

Braiding Machines Wanted.

Second hand 16 and 20 carrier Round Braiding Machine, in good order. Must be cheap. FRANCIS, Textile World.

Cotton's Patent or Fashion Machines Wanted.

For ladies' stockings, gauge about 33, high spliced heels, spliced toes and double soles. Address A. W., this office.

IF YOU USE CUTS

HAVE THEM ELECTROTYPED BY

Salesman Wanted.

An excellent and permanent opportunity. Resident or travelling salesmen to sell on commission "Glugloss Gelatine," pronounced by textile experts as the most perfect and purest sizing for all grades of fabrics, for finishing, printing, stamping, glazing, filling and yarn sizing purposes. Its peculiar and intrinsic value and popularity recognized to the extent of its prompt adoption where tried, readily producing superior results at a lower cost than secured from the use of Albumens, Gelatines, Glues, etc. Replying state fully as to experience, present connection, territory and how often visited.

QUAKER CITY CHEMICAL CO, Station "R," Philadelphia.

Lace Tipping Machine Wanted.

Lace Tipping Machine, second hand or new. Address CROWN, care Textile World.

Fell Mongering.

Englishman, several years experience in one of the largest English fell mongering firms, (handling Australian B. A. and fresh skins) seeks like position in this country. Apply W. H, P. O. Box 210, N. Y. City.

—Wisconsin, Sheboygan Falls. The Brickner Woolen Mills Co., which has been running on half time for several weeks past has now secured a government order for 25,000 yards of blue woolens for uniforms, and is now working with a full force for thirteen hours a day.

EDWARD JEFFERSON & BRO.,

Worsted .·. Machinery,

28 Strawberry Street,

PHILADELPHIA, - - PA.

SOLE AGENTS FOR

J. B. Farrar & Sons, Halifax, England,

Buggella Cork Rollers for Spinning and Drawing.

MACHINERY Shafting, Hangers, Pulleys and Couplings. Machinery Steel in all sizes from 6 1-2 inches diameter down to 3-16 inch diameter, cut any length, always in stock. Cold Rolled Rounds, Squares, Flats, Hexagons, Octagons, Decagons, and all shapes finished to exact sizes. Everything in readiness to be shipped at once. Our goods are without a rival and our prices the lowest of all.

Telephone 314, South Boston.

COMPRESSED STEEL SHAFTING WORKS,

South Boston, Mass.

Expert German Finisher Wanted.

A man who is thoroughly acquainted with German finishing machinery and German finishing methods. Prefer one with a thorough knowledge of machinery. One who can operate as well as design and furnish information. Address in confidence,

G. F. care of Textile World.

Cotton Mill Man Wanted.

With $5,000 to invest in, and take management of cotton mill in Atlanta, Ga. Fine opening for competent man. Liberal salary. Address, MAGRUDER, 406 Austell Building, Atlanta, Ga.

Hosiery Mill For Sale or To Let!

A new plant, capacity 100 dozen per day.

Water Power To Let, 400 H. P., with excellent buildings.

W. M. DANA, Westbrook, Maine.

CORDUROY CUTTER.

Wanted, situation as boss cutter for overseer of corduroy and velvet cutters, hand or machine. 20 years practical experience on all kinds of cutting. Can give excellent American and English testimonials. A thoroughly reliable and trustworthy man. Address P. 163.

NEW PATTERNS

of all kinds of textile novelties (**French, English and German**) supplied by Season's Subscription at moderate rates, or in single parcels of 100—300 new patterns assorted as required, for **$10 per parcel.** Address full particulars as to styles wanted to

A. SMITH, 89 Rue Turenne,

PARIS, FRANCE.

Frank A. Stevens, *Pres.* Arthur H. Mason, *Treas*
Capital Stock, $500,000.

Sanford Spinning Co

FALL RIVER, MASS.

30,000 Spindles. Weekly product, 50,000 pounds 14s to 40s.

NOVELTY COTTON YARNS,

FROM AMERICAN PEELERS AND EGYPTIAN COTTONS.

OUR SPECIALTY: Superior qualities of Hosiery Yarns, Natural Shades of Cottons, and in Colors, Jaegers, Mixes, and Bleached, Hosiery Cops on Long Tubes, Skeins, Tubes, Cones and Lisle Thread Yarns. Furnished in Carded and Combed Qualities in Singles, 2, 3 and 4-plies.

The Best is the Cheapest.

It is BETTER and CHEAPER to wind yarn by the "Universal" system before shipment from the mill, thus insuring perfect delivery to knitting machines without rewinding.

UNIVERSAL WINDING CO.,

F. H. BISHOP, Manager.

226 Devonshire St., - Boston, Mass.

YARN DEPARTMENT.

Eastern Yarn Market.

Cotton Yarn. The American Spinners Cotton Yarn Exchange, Boston, in its June circular, reports the cotton industry as being in a very quiet condition, everyone waiting for something to turn up to improve the situation. There is, however, one very encouraging sign noted by it, and that is the large volume of business in general trade; the conditions of the same, especially in regard to railway earnings, merchandise exports being in good demand in almost all the staple commodities. This coupled with the fact of good crops and with an abundant and easy money market, imparts considerable vigor to business. The Bureau of Statistics at Washington, has issued the statement of our country's foreign trade for April, and the ten months of the fiscal year makes the most remarkable showing in the history of the United States. In the past ten months we have sold and exported more than twice as much merchandise as we have bought from abroad. To be exact the total merchandise exports for the ten months were $1,025,426,681, the imports $511,181,186, showing an excess of exports of $514,245,495 on the right side of the balance sheet of this country. If we can continue this good work we shall certainly see an improvement along our industrial lines in cotton and woolen business, as we have touched bottom, and the present conditions certainly point to a much better feeling and higher range of values. Knit goods manufacturers have advised us that there is very little improvement in demand for goods and that their salesmen find but very little new business. The price of American cotton has changed but little, and the present quotations show but very little advance during the past three months. Egyptian cotton has declined during the past 30 days in some of the grades owing to less demand from spinners. The standard mills on hosiery yarns make no changes; still prefering to reduce their output rather than lower their prices. The southern manufacturers of yarns are willing to accept business at lower rates. Fine cotton yarn spinners are now beginning to experience a light demand for their yarn and are willing to accept business on a lower basis. Print cloths we are pleased to note, have improved, advancing from 1 7/8 to 2 cents.

Woolen Yarn. Spinners are not getting much new business although some sample orders are being placed. Buyers of woolen yarn are beginning to feel the effect of the recent failures of yarn spinners and are adjusting their business accordingly. It is a fact that when business is flourishing machinery for spinning yarn is not sufficient to handle the volume of requirements. The rubber boot lining business, which consumes considerable yarn, is now being handled direct by the rubber boot trust, and other knitters will have to find new outlets for their product. Spinners cannot expect much business until fall. The whole industry seems to be in a state of expectancy. The outlook is satisfactory, but the immediate prospect is not encouraging. Some business is being done on 2-ply yarns for sweaters, and cotton wool spun yarn is being substituted for all-wool. The whole tendency of the trade is for something cheaper. Notwithstanding the fact that wool has advanced over 100%, buyers want fabrics and garments at the same price as under free wool, even if the quality must be lowered. The manufacturers who listen to these demands are the only ones who will suffer, as the better class of trade are finding that garments and fabrics to match old prices are commodities which cannot be forced on the consumer at old prices and are calling for better. Buyers are slowly but surely being forced to purchase better garments and pay

(Continued on page 131.)

Frank E. Patterson, Prest. Oscar W. Wood, Treas

Germantown Spinning Co.

COTTON CARDED

HOSIERY YARNS

In numbers from 6s to 26s.

Germantown, Philadelphia.

W. Warren Thread Works,

WESTFIELD, MASS.

HOSIERY AND SEAMING YARNS.

Also Polished Threads.

Our bleaching and dyeing facilities are new and unsurpassed for prompt and neat work. Correspondence solicited.

AMERICAN SPINNERS'

Cotton Yarn Exchange.

COMBED AND CARDED COTTON YARNS

From Northern and Southern Mills.

ARNOLD B. SANFORD, - MFRS. AGENT,

45 Milk Street,

BOSTON, - - MASS.

Knitting and Weaving Yarns

Cones, Cops, Warps, Skeins,
Single, Double, Three-ply, etc.
Peeler, Egyptian, Mixed Colors.
Large Assortment.

EDWARD S. HYDE, 223 and 225 Chestnut Street, **Philadelphia, Pa.**

(Continued from page 129.)

and if it had not been for the strong statistical position of Australian wool, prices would have been much lower. The fact of a falling off in the number of sheep in Australia cannot be ignored, and the price at the end of December materially stiffened in consequence. We took in 1897, during the first four sales in London, 164,000 bales as against 26,000 bales during the same period of 1896, to say nothing of the large quantities of wool in markets other than London. The situation in South America is about the same as we find it in Australia. The whole of the River Platte country has undergone an exceptionally dry and rigorous winter, which did no good to pasture lands and only promoted the growth of burrs, etc. No rain fell during the spring and every indication was against a good clip, in quality and yield. The statistical position of Australian and South American wool shows that this year's short supply of raw wool is barely enough to satisfy European mills and must easily be consumed for the simple reason, that, while consumption has been going steadily ahead, the supply has been going back. This last will also apply to this country. Consumption is going on—production is at a standstill. The European business, and in fact that of the world, seems to defy statistics. First came the great engineers' strike in England and the difficulties in Turkey; then the stagnation in our country, caused by over buying in 1897, and now comes the war between United States and Spain. This war from its indefinite nature and possible surprises many instances contracts are placed not to the lowest bidder or to the one who could deliver the goods quickest, but to Philadelphia, apparently, regardless of the matter of cost or delivery. Some of the contracts have been given to Philadelphia concerns which eventually were sublet to New England concerns. Now that the principal contracts have been placed, the government says that this shall all be changed, and that hereafter the contracts shall go to the lowest bidder. There is a movement to have the specifications for overcoatings and army cloth changed to fit the improved methods of manufacturing, so that the modern mills may compete for the cloth. It is said that the present specifications were made many years ago and have continued the same regardless of the advanced methods of manufacture. It is claimed, if the specifications are changed the government

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CATLIN & CO.,
YARNS.
67 Chauncy St., Boston
216 Church St., New York.
206 Chestnut St., Philadelphia.

ALEX'R KING & CO.
YARNS.
FINE IMPORTED YARNS A SPECIALTY.
54 Leonard St., New York.

JAMES E. MITCHELL & CO.,
Commission Merchants.
122 & 124 Chestnut St., Philadelpia, Pa.
6 & 8 Summer St., Boston.
Cotton, Woolen & Worsted Yarns.
All numbers on Hand and Made to Order.

O. S. HAWES & BRO.,
WEAVING and HOSIERY **YARNS,**
All Plies and Numbers.
Imported Yarns a Specialty.
82 and 84 BEDFORD ST., FALL RIVER, MASS.

TUCKER & COOK MFG. CO
MANUFACTURERS OF
WHITE AND COLORED COTTON **WARPS**
Nos. 6s to 30s,
On Beams, Jack Spools or in Chain
CONWAY, MASS.

GRANT YARN CO.,
COMBED AND CARDED COTTON
YARNS 40s and above. AND
FITCHBURG, MASS. **WARPS**

E. JENCKES MFG. CO.
Colored Cotton, Hosiery, Woolen and Merino **YARNS**
PAWTUCKET, R. I.

LINEN YARN IMPORTER.
Hughes Fawcett, 115 Franklin St., New York,
Flax, Hemp & Jute Line and Tow Yarns,
FOR WEAVING PURPOSES
Linen Jacquard Harness Twines.
Fine Cotton Harness and Heddle Twines.
For Cotton, Silk, Woolen and Carpet manufacturers. Correspondence solicited. Samples promptly furnished.

CAPACITY, 50,000 Spindles.

ORSWELL MILLS

FITCHBURG MASS.

COMBED OR CARDED

COTTON YARNS

In Chains and Skeins, on Balls, Beams, Spools—single or twisted.

The J. R. MONTGOMERY CO.,

WINDSOR LOCKS, CONN.

Mercerized Cotton Yarn in two or more ply. Gives a permanent lustre equal to spun silk.

Novelty Yarns, Mohair Loops, Cotton Flake and Nub Yarns.

High Grade Cotton Warps, in colors, on beams, in chain warps or in skeins, single or two-ply.

Printers of Cotton, Wool, Worsted or Silk Yarns.

PLAIN AND FANCY PATTERN

Cotton Warps,

WHITE, MIXED AND COLORED.

For SATINETS, BLANKETS, ETC.

WHITTIER COTTON MILLS,

LOWELL, MASS.

INDIAN ORCHARD CO.,

Indian Orchard, Mass.

MANUFACTURERS OF

Lustred Cotton Yarns.

In Various Colors and Twists.

NOVELTY YARNS

In Cotton, Silk and Worsted, in various patterns and colors.

Cotton Warps and Yarns

In Gray and all colors, single or 2, 3, 4 and 6 ply, and Cable Cord.

COLORED COTTON

Machined, Carded or in Roving.

(Continued from page 131.)

is for the present the great disturbing element, but will undoubtedly react favorably for the United States, and Spain as well, as it will modernize the latter country and increase the influence of the former.

Worsted Yarn. Spinners are getting some orders with business in spots. We hear of some mills securing orders for light weight to a considerable extent. Some orders are being placed for worsted dress goods in 2/36's, in the neighborhood of 65 cents per pound. The bunting manufacturers continue busy, and we note there is a run for ladies' dress goods in army colors. Some very good orders have been secured from the government, and mills securing contracts are running day and night to finish them. Business for staples is scarce, and it looks as though many of the fine worsted mills would be closed unless there is an improvement. The war scare talk is getting to be a "chestnut," and people are now laying the bad business to the weather; the bad weather having reduced sales over 50%. We hear of one weaver as having sold over half the production of his mills on one style, and had not opened the samples of his regular line. The piece dyed cloth is selling best. Fancy all-wool worsteds are selling badly. Cutters are sorry they cancelled orders so freely as there is a call for the heavy weights with no stocks to draw from. Orders which have not been cancelled and whose deliveries have been delayed have not been manufactured, as weavers are unwilling to take chances of cancellations later in the season. Jobbers and commission merchants have been ordering a variety of styles in piece lots. Some of the Philadelphia spinners are doing better as to orders, although their outlet is not apparent. The French spun yarn spinners are all busy, but running on orders placed, in some instances, over a year ago. We hear a great deal of fault found with the government methods of awarding contracts. In advance prices. Manufacturers say that they expected but little benefit from the advance in wool caused by the tariff. The season did not open favorably for foreign wool. The London market realizes now more than ever before that it has lost the American market, both on wool and manufactured articles, until such times as shall see the woolen industry established on the new standard of values,

(Continued on page 135.)

Colchester Mills,
SPINNERS OF
Made from Colchester Mills Sanitary Random Yarn
Mule Spun Cotton Hosiery Yarns.
Sales in Charge of A. D. SALKELD, 86 & 88 Franklin St., NEW YORK.
Representing B. B. Smalley, Thos. F. Patterson, F. E. Snow Receivers Colchester Mills.

WOOLEN AND MERINO YARNS.
Special line for Bicycle and Golf Goods in all shades For Hosiery, Gloves, Underwear, and all kinds Knit Goods. Cop, Cone and Skeins.
The J. & H. Clasgens Co.
New Richmond, O.

WOOLEN YARNS.
All grades Woolen, Mixed and Merino yarns.
15 SETS CARDS.
EDWARD M. ROCKWELL,
LEOMINSTER. - MASS.

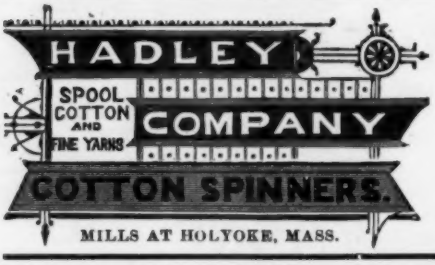
A. HERBST. J. W. JONES.
HERBST & JONES,
Successors to Kershaw Worsted Co.
WORSTED YARN SPINNERS,
21st & Naudain Streets,
PHILADELPHIA.

ALBERT R. ELSASSER,
Clifton Worsted Mills.
Lustre Worsted Roving and Yarns
A SPECIALTY.
MILLS: ADDINGHAM, DEL. CO. PA.

C. MOORE & CO.,
MANUFACTURERS OF
TWINES, THREADS AND YARNS.
Jacquard Harness Twines of all kinds on hand and made to order.
S.W. COR. FIFTH & MARKET STS.,
Philadelphia.

EICHMANN & STERNBERG
530 Broadway cor. Spring St., NEW YORK.
Plain and Gassed Cotton Yarns,
HOSIERY COTTON YARNS,
Mercerized Cotton Yarns (Simile).

COTTON WARPS
White or Colored.
Toweling and Grain Bags.
Dana Warp Mill,
WESTBROOK, MAINE.



SPINNERS OF
FINE COTTON YARNS
30s TO 100s.
Gray, Bleached, or Colored. On cop, in skein on spools, cones or tubes.
Fine Cotton Warps, single and two-ply, in chain, etc.
Spool Cotton and Seaming Thread.
95 Milk St., BOSTON.

THE WILLIAM CLARK COMPANY,
WESTERLY, R. I.
Mills equipped with the latest and most improved machinery.
Combed Egyptian from No. 20s to 100s. Combed Sea Island from No. 40s to 200s.
Also 2, 3, 4, 5 ply and 6, 9 and 12 plv cable laid.
Hosiery Yarns on Cops Tubes or in Skeins, Grey, Bleached or Dyed. (Fast Colors.

GREENE & DANIELS MFG. CO.,
COMBED, CARDED AND GASSED
Yarns, Threads, Twines and Chain Warps,
Colored and Bleached Yarns Furnished in any manner desired by the trade. **PAWTUCKET, R.I.**

MONUMENT MILLS,
Manufacturers of
White, Colored, Fancy and Double and Twist,
COTTON WARPS
HOUSATONIC, MASS. 4s to 60s.

YARNS
SOLIS : : BOSTON.
179 Devonshire Street.
ANDREW J. SOLIS, Jr. & CO.

YARNS All Numbers and Qualities.
HOLLAND & WEBB,
487 Broadway, New York.

Cohannet Mills,
TAUNTON, MASS.
Spinners of High Grade
HOSIERY YARNS OF EVERY DESCRIPTION.
Selling Agents JAMES E. MITCHELL & CO., Philadelphia and Boston.

NEW ENGLAND THREAD CO.
PAWTUCKET, R. I.
Manufacturers of Spool Cotton & Supefine Tapes
Thread and Yarn on Tubes and Cones for the Hosiery trade etc. Thread dressing a specialty, for weaving purposes. Dyers and Bleachers of Threads, Yarns and Tapes.

BURNET & CO.,
24 George Sq., Glasgow, Scotland.
All numbers and qualities of Cotton Yarns, specialities in
"Silkoline," "Ramie" and Fancies; also bleached filling on long tubes. Turkey reds, etc. A B C Code used. Telegraphic address "Tenrub, Glasgow."

A copy of the Textile World's Directory is presented to every paip-up subscriber of the Textile World, with the compliments of the publishers.

Continued from page 133.

will get better cloth for less money. Salesmen from the various spinning mills and all others are striving for business with poor success. Buyers are trying to work prices down, but the wool market will not warrant too great a decline, except where mills own wool bought at a low figure and are willing to sell under the present basis of the wool market. It is said that some spinners own wool at a low price, and if they secure an order at an advance in price over former ones they are willing to fill it. Without doubt yarn can be purchased cheaper today than was the case four weeks ago, notwithstanding the condition of the wool market. Rockville mills are doing but little on regular fancy worsteds of fine quality. The Rock and American mills are running on government contracts secured it is said, through a Philadelphia party. The fine Rhode Island mills are not running in full. Those manufacturing the cheaper cotton worsteds are running well on yarns contracted six or eight months ago. The astrachan trade is flat. Prices continue as below:

2/40s Australian	$.95
2/50s "	1.00
2/20s, 3/8s Blood	.55
2/36s, 1/2 "	.75

The Philadelphia Yarn Market.

There has been considerable softening in the yarn market, the past month. Trade has been duller all around. While we think stocks have not accumulated particularly, it has been a buyers' market all the time. Many orders have been cancelled, or deliveries held up, on heavy goods, made with cotton warps.

The upholstery trade is dull. The carpet trade has not been benefitted any by heavy auction sales.

Deliveries on old orders have been only fair.

Worsted and woolen business is still very dull. Prices nominal. We understand many large orders that were placed, have been held up pretty liberally with spinners, as weavers had positively no orders to put the yarn into.

We quote as follows:

WARPS.

20/1	12¾
22/1	13
26/1	13½
12/2	13½
14/2	14
16/2	14
14/1	12 to 12¼
16s	12½
20/2	14½ to 14¾
30/2	18 to 18¼
30/2 Eastern . . .	18¼ to 19
40/2	23½ to 24

SKEIN.

26/1	13 to 13½
20/1	13
19/1	13
4s to 10s soft . . .	11½ to 12
12/1 soft	12 to 12½
20/2 medium . . .	14 to 14½
14/2	13
30/2	17 to 17½
26/2	16 to 16½
40/2	23 to 23½
8/3	11 to 11½

(Continued on page 137.)

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(Continued from page 135.)

10s double reeled	11 to 11½
16/3 slack	13
16/4 medium	13
16/2 slack	13 to 13½
9/4 slack	11

SOUTHERN CONES.

6s to 8s, various qual.	12 to 12½
10s " "	12½ to 13
12s " "	13 to 14
14s " "	14 to 14½
16s " "	14½ to 15½
20s " "	15½ to 16
24s " "	16 to 17
26s " "	16½ to 17

SHUTTLE COPS.

6s to 8s	12 to 12½
12s	12½ to 13
16s	13
26s	13½
40s	18 to 19

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10s	13½ to 14
12s	14 to 15
14s	15½
16s	16

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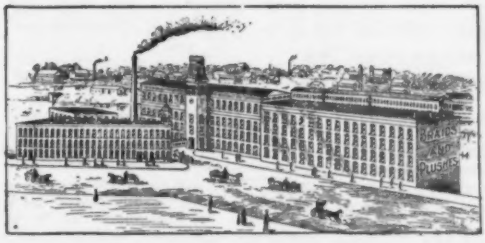

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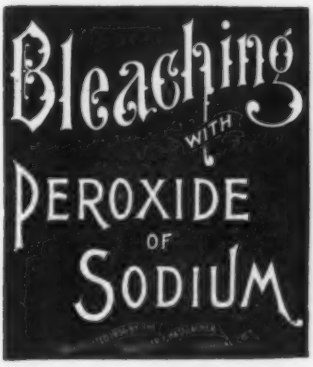

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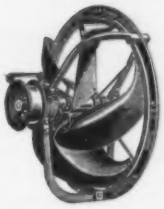

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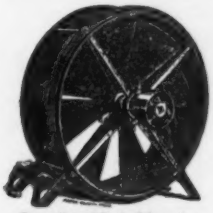

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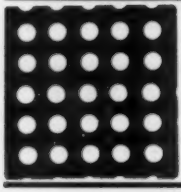

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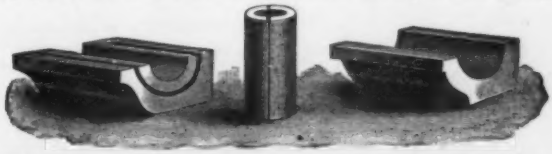

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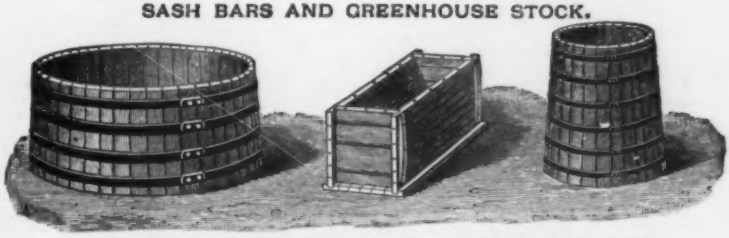

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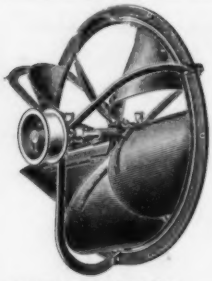

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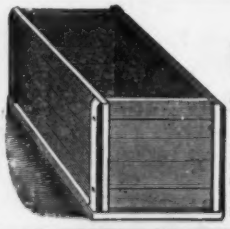

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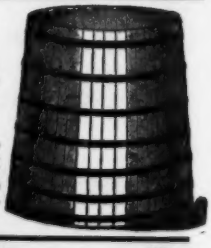

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Tanks, Vats, and Dye Tubs,

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Factory Jersey City. STORM DEFYING WIND MILLS.

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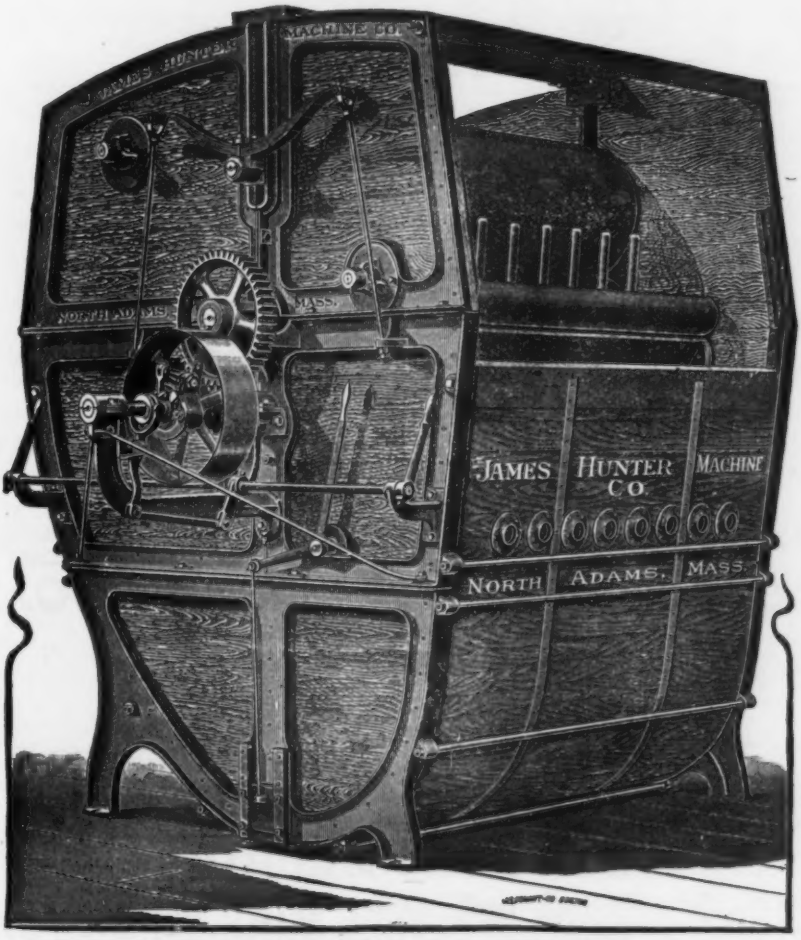
For Four, Six and Eight Strings of Goods.



Power transmitted by means of a Friction Pulley.
No Shifting of Belt to start and stop the machine.
Less power required than for any other Washer of equal capacity.
All Main Bearings are adjustable. All Bearings are on the outside of frames.
No dripping of Oil on the Goods, or in the Wash Box.

Also Combination Washer and Fuller for Knit Goods in the String.

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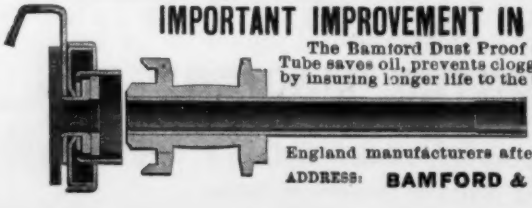

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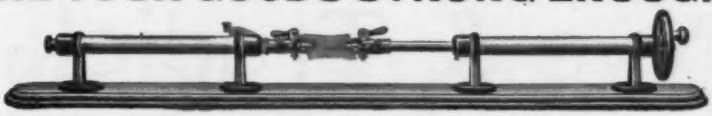

Every manufacturer has had experience at some time with tender goods, entailing claims, expense in replacement, and great annoyance to manufacturer and customer. This can be prevented by the use of the

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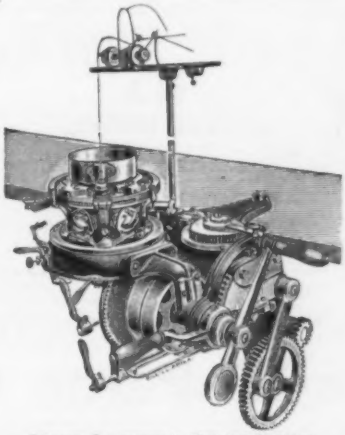

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All Sizes and All Gauges.

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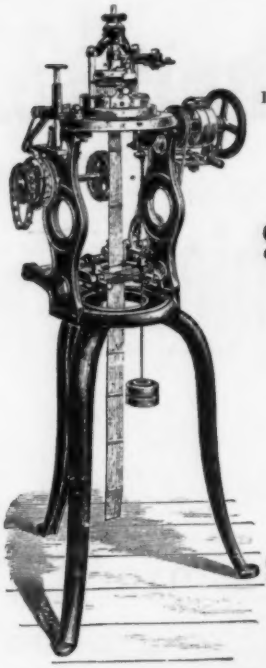

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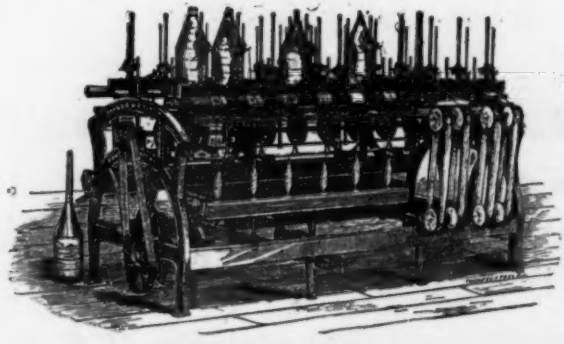

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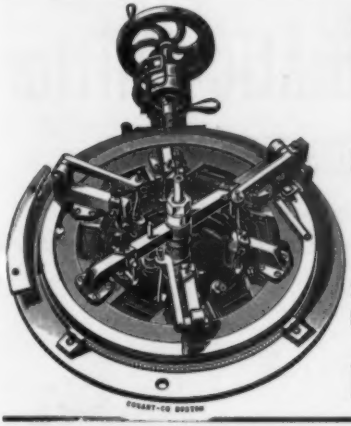

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giving GREATEST PRODUCTION,

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Automatic racking or shogging; Sweater Collar Machines.

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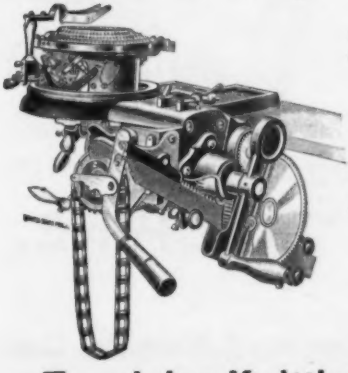

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With or without Double Sole Attachment.

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Its Range of Work is from very coarsest up to 200 needle cylinders.

It is unequalled for either Coarse Socks or Finest Ladies' Hose.

We invite Comparison

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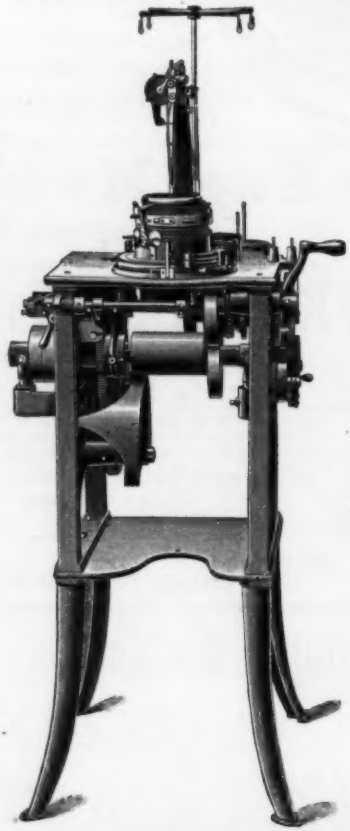
Extra thread in heel does not show in instep.

For shaping, or to accommodate varying reinforcing threads, the

Length of Stitch and Tension are Automatically Regulated. At any point.

Every movement positive and fully automatic.

Best method of *transfering ribbed legs and tops.*



High Spliced Heel

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It has the *only* perfectly practical *automatic device* for changing the yarn in heel and toe.

It is Extremely Easy on Yarn

Light Running, Simple, Durable, and Economical.

A mill fitted with our machines can produce a far greater variety of weights and styles than any other machine on the market.

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From the Coarsest to the Finest Gauge

Among the many strong claims for this machine are

The Highest Speed,
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For all classes of Ribbed Hosiery and Underwear, Combination Suits, Sweaters, etc.

ESTABLISHED REPUTATION FOR

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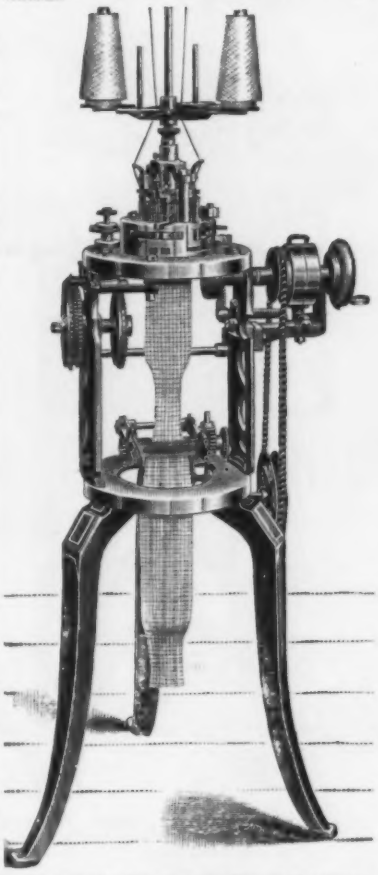

Automatic Sleever ane Fancy Hosiery Machine.
Showing Chainless Measuring Attachment.

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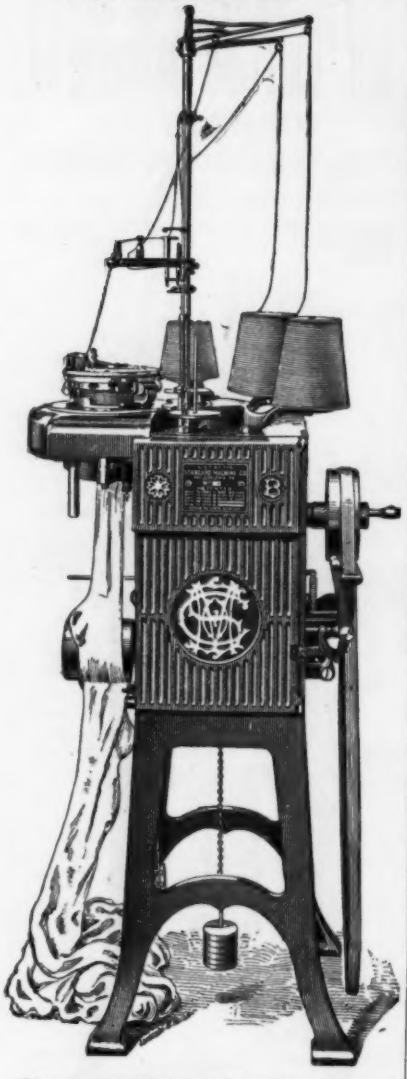

Gives greatest production, fewest menders, less cost for maintenance and best fabrics.

More Standard in use than any Automatic Machine on the market.

The best, therefore the cheapest.

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Estimates furnished for complete Hosiery plants.

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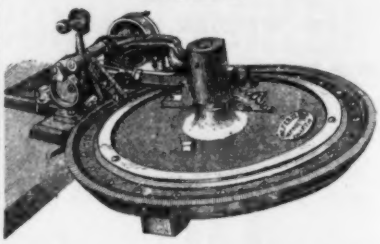

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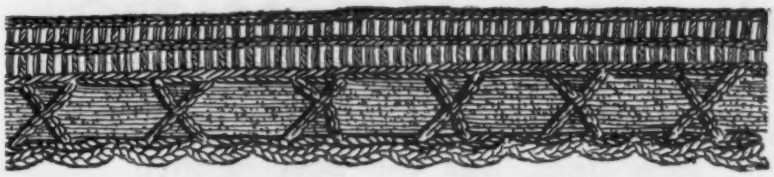

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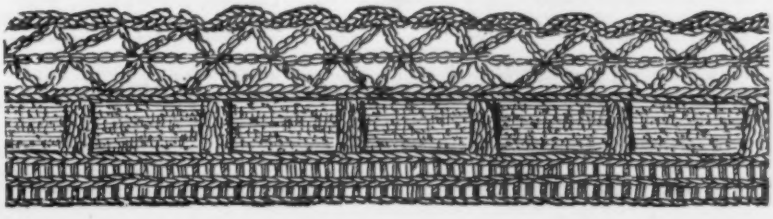

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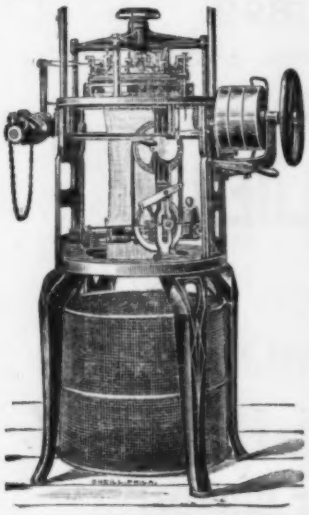
Makers of Wrought Steel Cylinders and Dials for all kinds of Machines.



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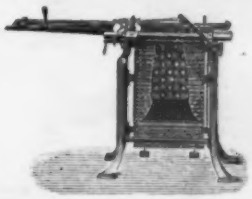

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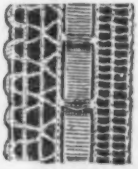

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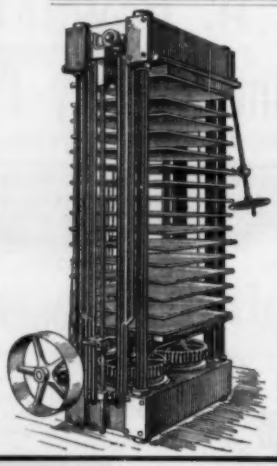

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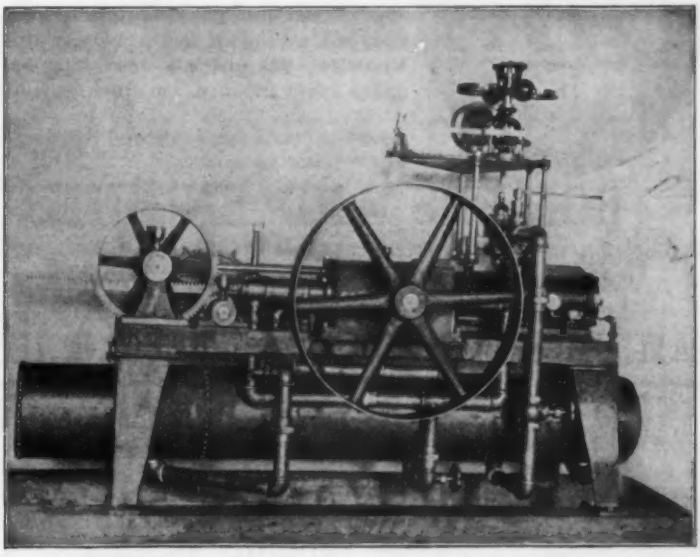

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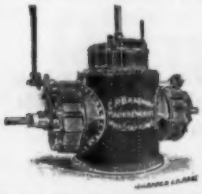

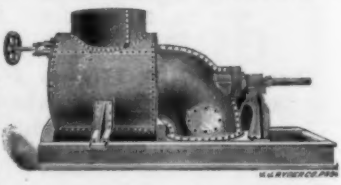

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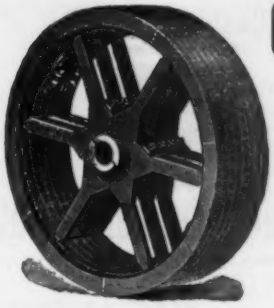

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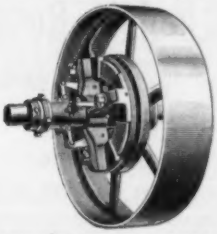

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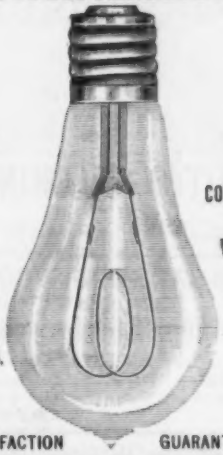

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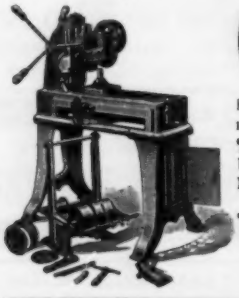

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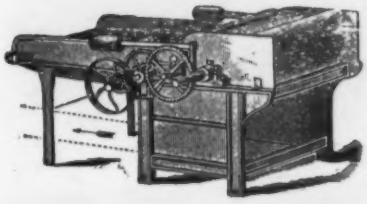

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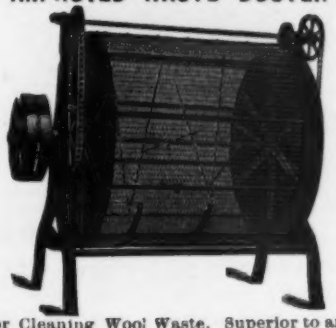

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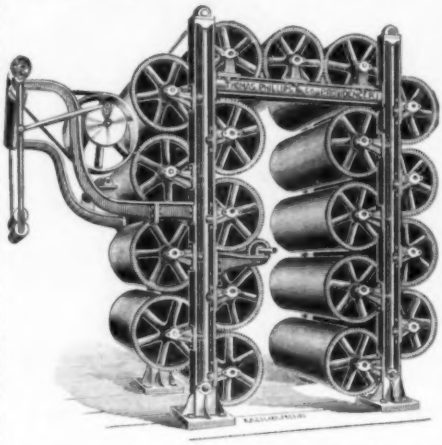

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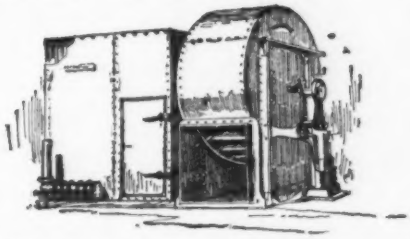

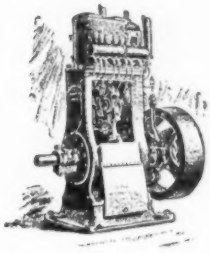

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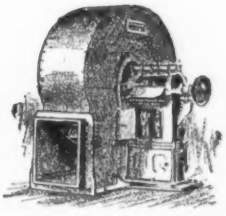

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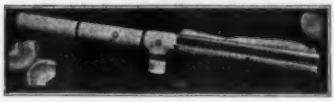

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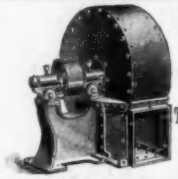

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